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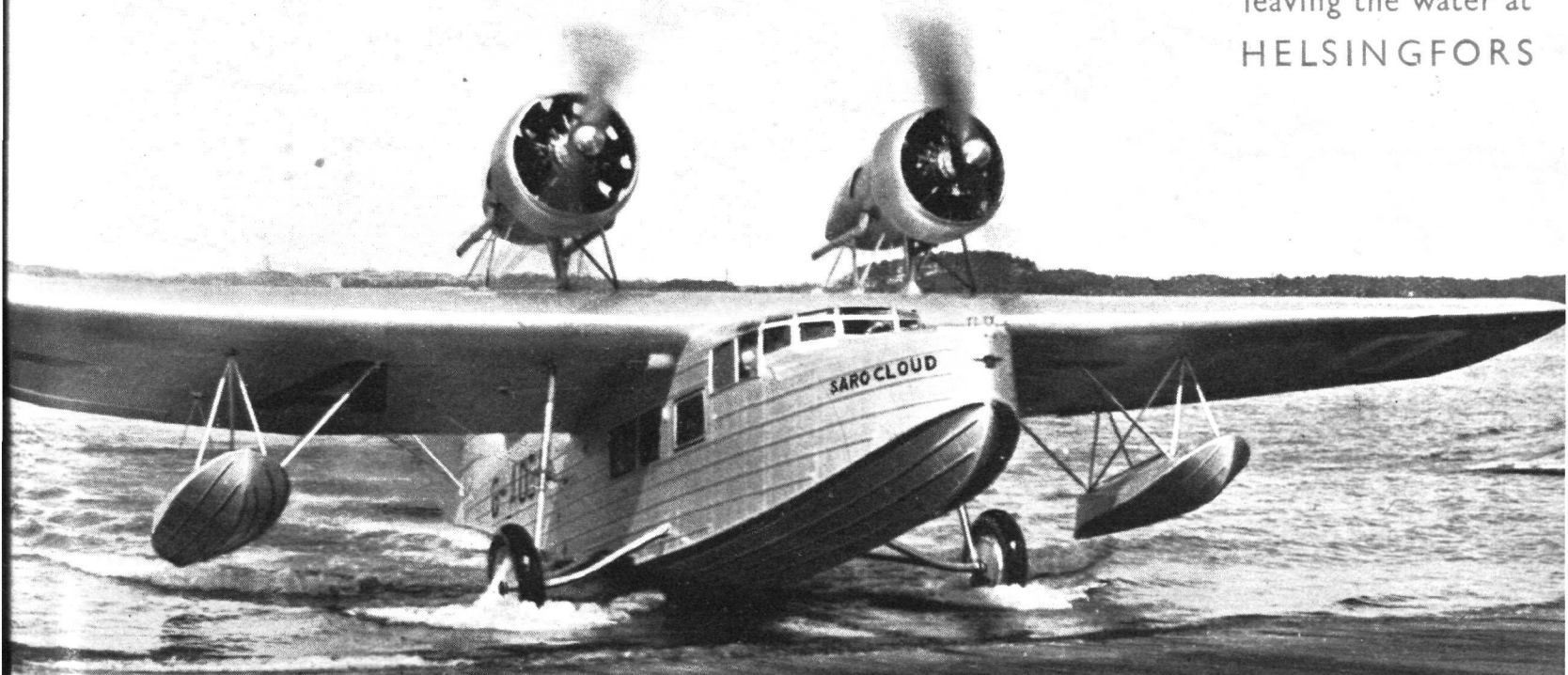
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No. 1291  
Vol. XXV  
No. 38

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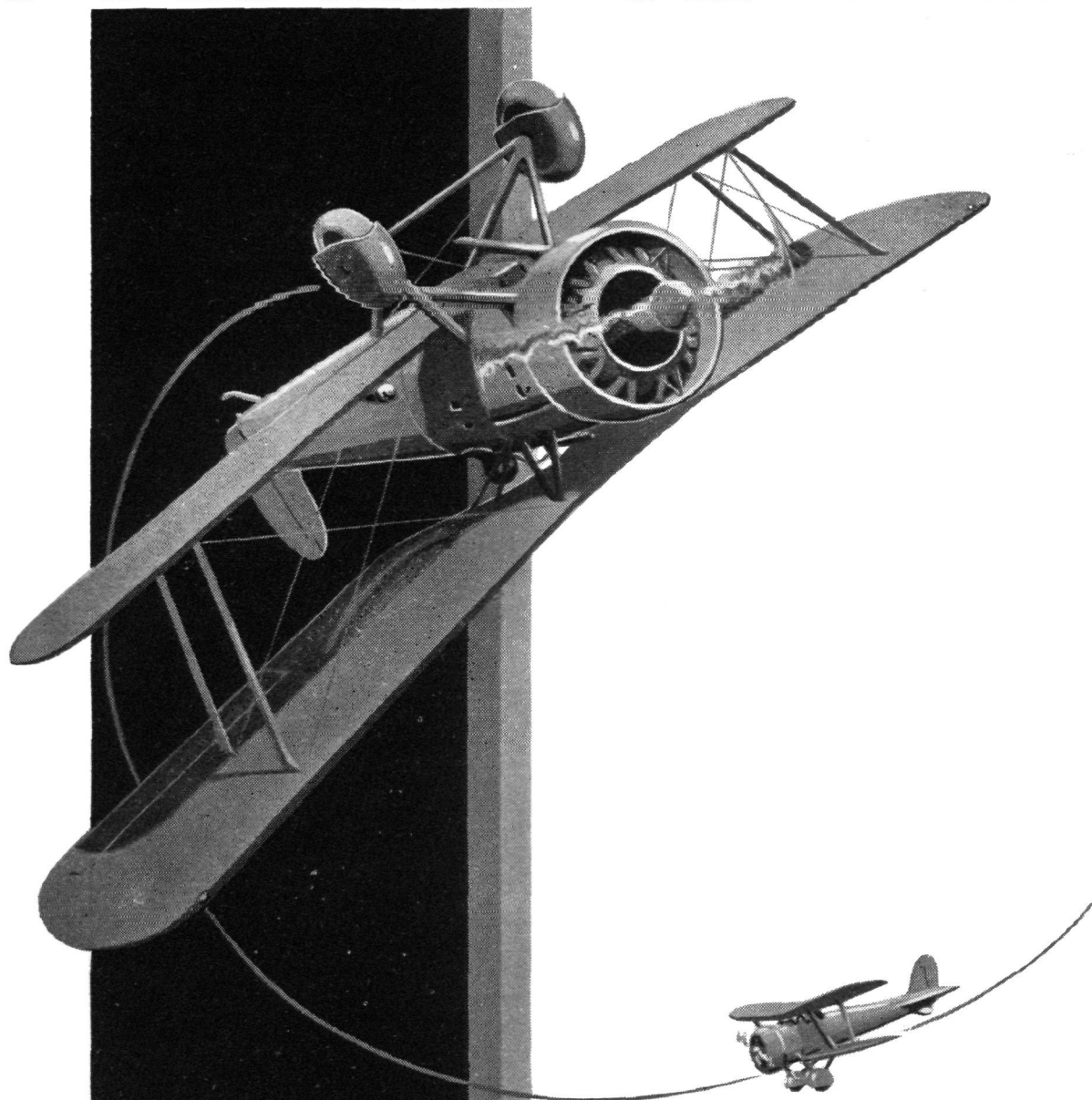


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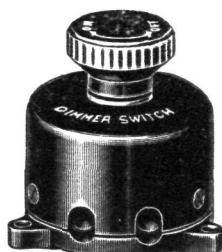
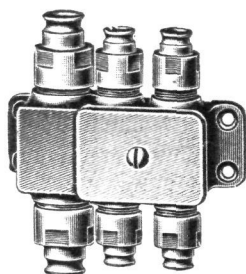
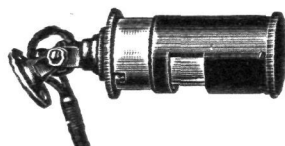
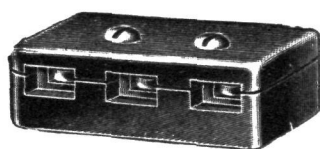
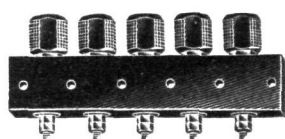
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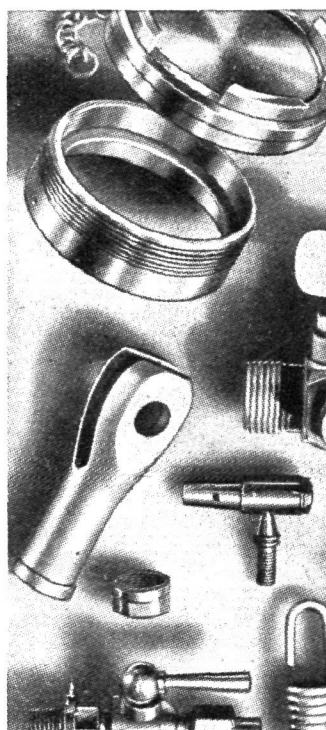
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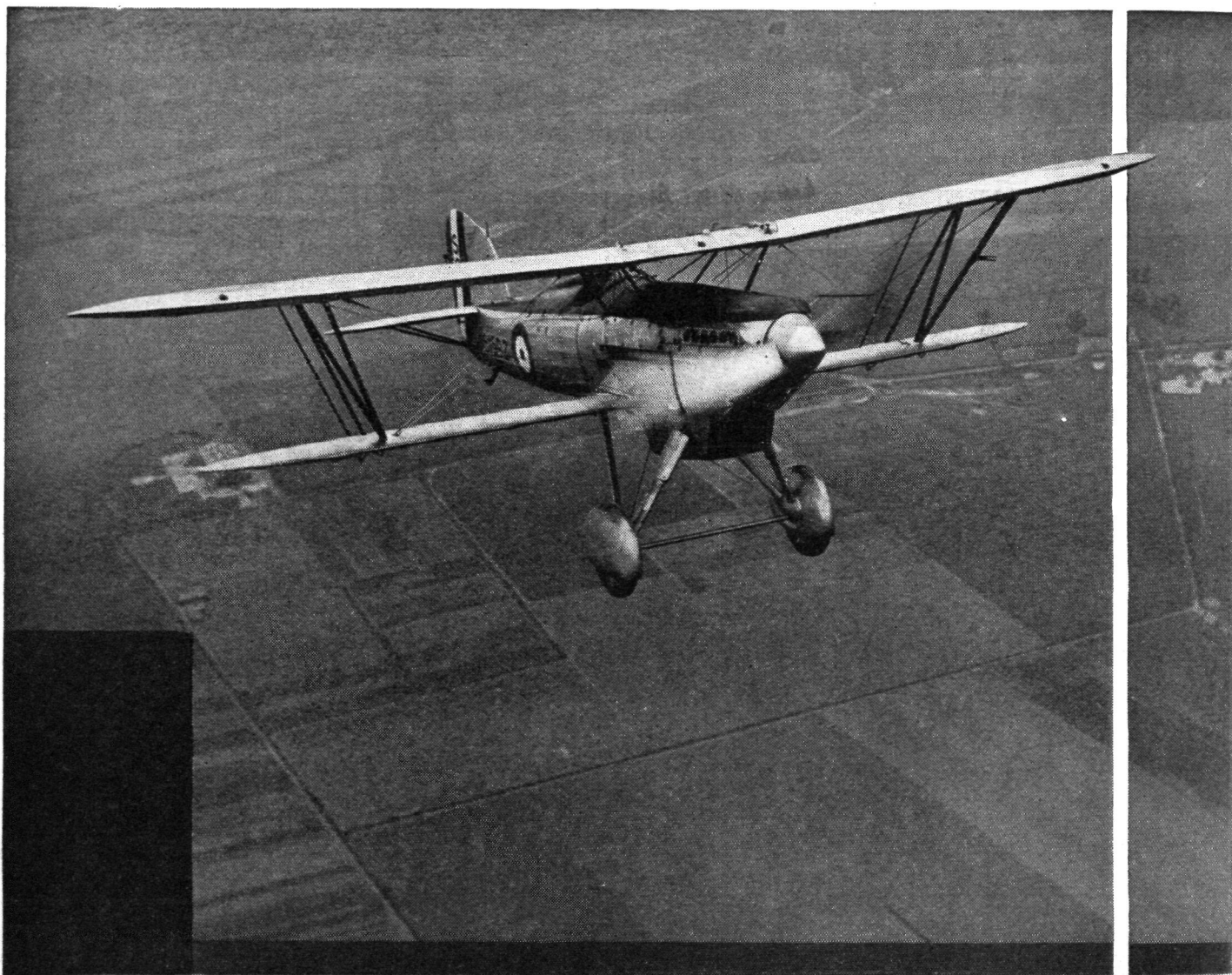
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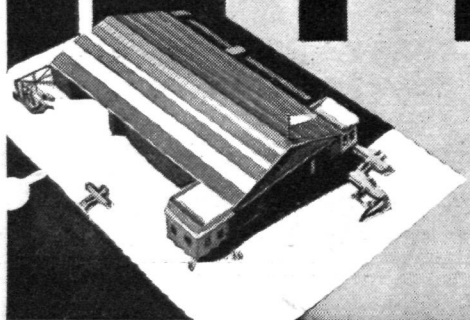
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A Journal devoted to the Interests, Practice and Progress of Aerial Locomotion and Transport

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM

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## DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list:—

- 1933.
- Sept. 17-24. "la Bienvenue Aerienne" at Rheims.
- Sept. 23. Dinner and Dance, London Aeroplane Club, Hatfield.
- Sept. 24. "Air Survey Work." Lecture by Maj. H. Hemming, at Wills Hall, Bristol.
- Sept. 27. International Air Traffic Association Bi-Annual Conference.
- Sept. 29. Stage and Screen Ae.C. Gymkhana and Theatrical Garden Party, Hatfield.
- Oct. 7-8. B.G.A. Gliding and Soaring Competition.
- Oct. 12. "Air Traffic Control." Lecture by Maj. R. H. S. Mealing before R.Ae.S.
- Oct. 21. Annual Reunion Dinner of No. 6 Wing, R.N.A.S., and Nos. 66 and 67 Wings, R.A.F.
- Nov. 2. "Variable-Pitch Airscrew and Variable Gears." Lecture by W. G. Jennings before R.Ae.S.
- Nov. 3. Norfolk and Norwich Aero Club Annual Ball, at Thatched Assembly Rooms, Norwich.
- Nov. 16. "Stiffness of Aeroplane Wings." Lecture by H. Roxbee Cox before R.Ae.S.
- Nov. 25. Comrades of the R.A.F. Reunion Dinner, at Thames House Restaurant, Millbank, S.W.1.
- Nov. 30. "Tail Buffeting." Lecture by W. J. Duncan before R.Ae.S.
- Dec. 7. "Possible Future Development of Aircraft Engines." Lecture by A. H. R. Fedden before R.Ae.S.
- Dec. 8. Calshot Reunion Dinner, at R.A.F. Club, Piccadilly, W.1.
- Dec. 14. "Light Alloys for Aeronautical Purposes." Lecture by L. Aitchison before R.Ae.S.
- Dec. 15. Close of entries for International Touring Competition (1934), Poland.
- Dec. 18-24. International Rally at Cairo and Meeting of the F.A.I.

## EDITORIAL COMMENT



We desire to extend a hearty welcome to all the delegates to the International Air Traffic Conference who are assembling in London for the session next week. It has been wisely said that air transport makes for the abolition of national frontiers. There has even been talk of making the whole industry international, and all readers of Rudyard Kipling will remember his conception of an A.B.C. (Aerial Board of Control) which apparently had over-ridden all that is harmful in nationalism, and had become a beneficent dictator of civilised mankind. We have not yet got to that stage, but so far as it is possible we do want to see air travel bringing the nations together by means of personal intercourse and rapid exchange of correspondence.

If each nation were to work out its own system of operating an air line, it might well come to pass that air travel from one country to another might be so troublesome that few would care to undertake it. Everyone knows that some nations are addicted to extremely meticulous methods of dealing with papers. Others may appear to foreigners to be too happy-go-lucky, and then the traveller will wonder whether the machine will start up to time, and whether he will find his seat reserved for him. There are so many possible ways of dealing with tickets and personal identification papers, that if every nation developed its own system to the top of its national bent, the crossing of a frontier and the passing through Customs might perhaps become more of a nightmare on the airways than it already is on the railways.

When diverse and complicated systems are applied to the passage of goods from one country to another, the result may be a definite check to traffic, and a loss of profits to all the parties concerned. Air transport ought to make all these things easier, not more difficult, and we believe that the directors of the air transport companies in most countries definitely desire that things shall be as easy as possible for the air traveller and the air trader. Therefore



it is a very good thing indeed that all the companies of Europe should get together at frequent intervals—actually every six months—and talk the problems over together.

The meetings are held in secret. We imagine that this is not done because of the dark and dubious nature of the plots to be hatched, but out of sheer pity for the Press and public of the country in which they meet. The Press would feel bound to report the meetings if their representatives were admitted, and the public might try to read the reports. The same thing has recently happened at a session of some learned society in this country, and as a result we have had a lively discussion, not on the subjects with which the meeting was concerned, but on the technical jargon in which the papers were couched. Well, we must admit that FLIGHT sometimes is guilty of writing technical jargon, but at least we only expect such articles to be read by people who understand that language and who enjoy reading it. International transport by air or by any other element has its own jargon, and we must say that we feel gratitude to the I.A.T.A. for not expecting us to understand it and to attempt to translate it into language which our readers will understand. If the results of the meetings are that air transport is unified and simplified, so that air travel and transport become easier and more popular, we shall feel satisfied, and shall be quite content not to probe into the mysteries of how the gratifying result has been achieved.



To-morrow, if the weather is suitable, there will begin two days of combined exercises by the Royal Navy and the Royal Air Force of a nature not previously attempted. Briefly, a small but powerful

**Air and Sea Exercises** fleet, which includes two aircraft carriers, will attempt to attack shore bases in the Firth of Forth, while the defence will consist of aircraft alone. It is emphasised by both the Admiralty and the Air Ministry that these are not manœuvres, only exercises. To put the distinction in popular form, they resemble the knock-up before a tennis match begins at Wimbledon. No one will try to win the war. Both sides will simply practise their strokes. As nothing of the sort has been attempted before, no one knows clearly what strokes are likely to prove of much effect. Both Admiralty and Air Ministry want to get some idea on the subject. These exercises are only a beginning. They have been deliberately made as simple as possible, and they will be in many respects unreal. One exercise will be an attack on the shore by aircraft from off the fleet, although it is to be supposed that the ships themselves remain out of range of the defending aircraft. There is no difficulty in excusing such unreality when it is deliberate and avowed. When these exercises have given the two Government Departments a line on probable developments, it is the intention that in the future other more complicated exercises shall be arranged, from which it may really be possible to deduce lessons which will be of service in any future war.

The defending force is to consist of two squadrons of flying boats, one squadron of torpedo-bombers, lent to the defences by the Fleet Air Arm, four day-

bomber squadrons of the Wessex Bombing Area, and two Auxiliary A.F. bomber squadrons from No. 1 Air Defence Group. Naturally, the Wessex Bombing Area knows little or nothing about the sea and the ships which sail on it. The two Auxiliary squadrons, those of Edinburgh and Glasgow, live on the Firths of Forth and Clyde respectively, and may have a little more ability to distinguish between a battleship and a destroyer, but they can hardly be experts on what is called "ship recognition." The flying-boat crews and the men on the "Ripons" will, of course, know all about such matters. All will get some very good practice, and all should have a great deal more sea sense after these exercises than they had before.

The fleet, too, will get some good practice. "Aircraft recognition" is to be a problem for the men on the ships. Here the carriers will be in the position of experts, but all ships will have to become knowledgeable on the subject. "Ospreys" will be friendly to the fleet, but "Harts" will be hostile. "Seals" will also be friends, while "Gordons" will belong to the defence. Those who distinguish them when overhead will have reason to be proud of themselves. "Gordons," "Wapitis," and "Sidestrands" will be strange fowl to the majority of the Navy, but the sailors will learn what they look like. All will get good practice in taking appropriate action against air attack.

Other problems invite solution by actual trial. For instance, when a fleet is expecting an air attack, what is the best policy to follow with regard to its own fighters? Should they be sent up to patrol as long as their petrol lasts, running the risk that the attack will be delivered just after they have landed on the carriers and are helpless, or should they be kept in readiness on the deck until the enemy are reported to be approaching, running the risk that they may not be able to get up to the height of the enemy before he has delivered his attack and sheered off? To what extent will the destroyers be able to report the approach of the defending aircraft from the shore? These are among the many pretty problems on which some light may be shed.

If this really were a sham fight, it would seem that the shore or defending aircraft are rather heavily handicapped. In addition to the fact that some of them are working over a strange element, the force has no fighters, and sometimes, perhaps, it will have to use some of its "Harts" as fighters to escort its bombing formations, if it is thought that they need escort. Incidentally, no bombs, not even bags of flour, will be dropped. The accuracy of the bomb-aiming in the various squadrons of the Wessex Bombing Area and No. 1 (A.D.) Group is not in question. No casualties will be awarded, and our sensational papers will not be able to report that a capital ship has been bombed—though, as a matter of fact, some dummy torpedoes will be dropped by the T.B. squadron. At any rate, the vexed question of whether an aircraft can sink a battleship will not be raised anew by these exercises. Still, a lot of very useful lessons should be learnt, and the exercises should be of quite extraordinary interest. FLIGHT is sending special correspondents up to the Forth to report the happenings, and we feel sure that their accounts will greatly interest our readers.



# LONDON SESSION OF THE INTERNATIONAL AIR TRAFFIC ASSOCIATION



**T**HE Thirteenth Bi-Annual meeting of the International Air Traffic Association is to be held in London, in the Old Hall, Lincoln's Inn, on September 27 and 28. The chairman this year will be Mr. Woods Humphery, Managing Director of Imperial Airways, Ltd. The opening address will be delivered by the Marquess of Londonderry, Secretary of State for Air. The I.A.T.A. includes the principal air transport companies of Europe as its members, to the number of about 30, and holds its meetings in different European capitals in rotation. This year 15 countries will be represented at the session. After the opening address, the meetings are held in private.

The existence of I.A.T.A. is a tribute to the long sight of the late Sir Sefton Brancker, who, so long ago as 1919, saw that many questions of air transport would arise which could only be conveniently settled by having regular meetings of the various air transport companies. Of course, in 1919 air transport was in a very elementary state. The air lines of the world did not cover more than 3,000 miles. Since then the growth has been steady and continuous, and the figure to-day is more than 200,000 miles. Of these about 60,000 miles are flown over Europe. Nearly 800 aircraft are in regular operation in Europe, while about 150 Continental cities are connected with London by air.

This is an astonishing increase in the time. To watch the network of airways gradually spreading over Europe has been a fascinating task. We publish on another page a map showing the air lines now in existence over Europe, so far as we have been able to ascertain the facts. It must be admitted that the map looks more like a spider's web than anything else. But the more bewildering it is at first glance, the more impressive it becomes as one studies it. The multitude of the lines between the cities is the most gratifying, as well as the most bemusing, feature of this map. In fact, the harder it is to understand, the more may readers of *FLIGHT* congratulate themselves on the progress of air transport.

Of course, it must be realised that nearly all of these air lines are heavily subsidised by some Government. That is inevitable in the early days of a new form of transport, and these are still early days for aeronautics. These subsidies are investments, which in good time will surely repay the people who have provided them. Air transport has come to stay.

In addition to the map, we have collected some information, as complete as we have been able to make it,

about the air lines in all the countries of Europe which can boast any air lines at all. We hope that this will prove of interest to our readers, and especially to the delegates to the I.A.T.A.

Though the meetings of the I.A.T.A. will be held in secret, we feel sure that much important work will be done at them. Much has already been accomplished in past years in the direction of unifying the methods of airway operation. Traffic by air over inter-connected routes has been facilitated, facilities such as standard consignment notes for air-borne traffic have been provided, and methods of procedure generally have been simplified. It is work of a kind which never comes to an end. New questions are always cropping up, and require to be dealt with at the next meeting of the I.A.T.A. We wish the delegates a happy issue out of all their troubles in the coming session. A list of the delegates attending the present session is given on page 954.

## AIR-FRANCE

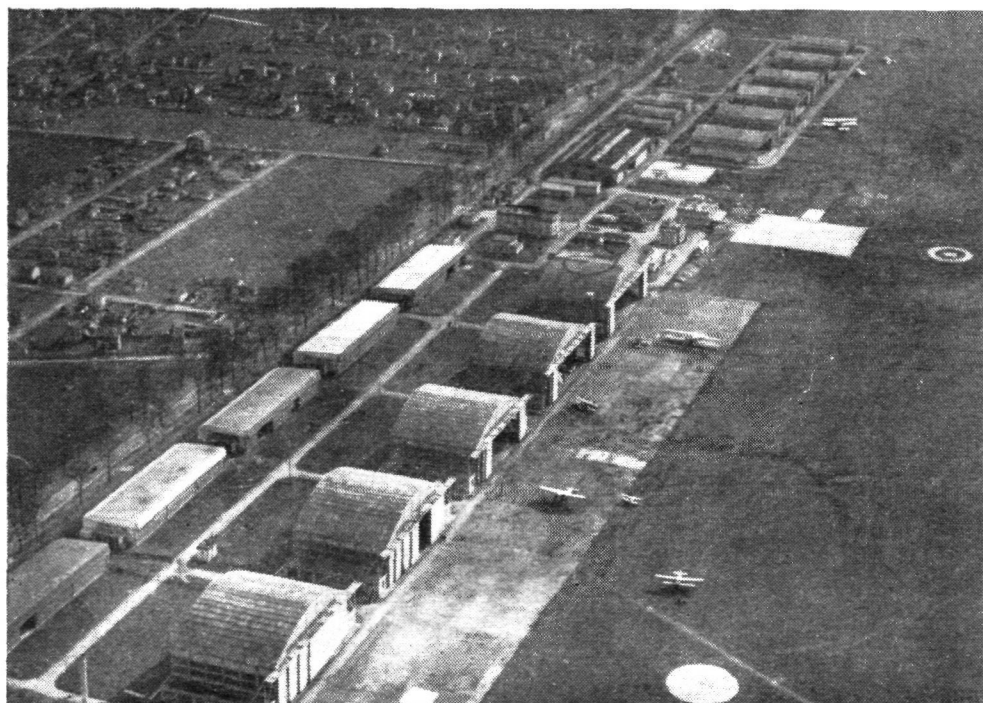
**C**IVIL aviation in France as represented by the air line companies has recently been subject to an interesting development. There has been a fusion into one huge organisation of the five principal companies, to operate under the name of Air-France. Monsieur Pierre Cot, the French Air Minister, has been primarily responsible for this unification, of which he has always been in favour. He is representative of the new type of Air Minister, who accepts his office with great enthusiasm and recognises the value and effect of acquiring practical skill by becoming a pilot.

The five companies amalgamated were: Air Union, Farman, C.I.D.N.A., Air Orient, and the Compagnie Aéro-postale. These concerns operated air routes which linked France with North Africa, Turkey, Sweden, Saigon (French Indo-China), and South America, to mention some of the most distant places. Air-France, the new company, has a capital of 120 million francs, and its board of directors constitutes members of the old companies, the number from each being in proportion to the capital invested, with M. Roume as President.

The chief pilots continue to be in charge of the respective routes, but economies have been achieved by a



The late Sir Sefton Brancker.  
(FLIGHT Photo.)



The Paris airport of Le Bourget, a junction for many air lines.

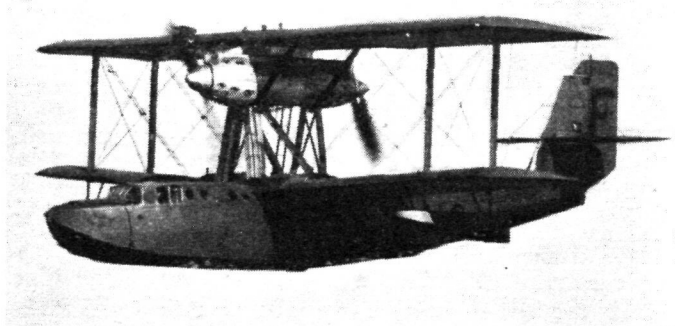
A Cams flying-boat used by Air-France on the Mediterranean services.

reduction of administrative posts, transfer of personnel and more productive employment of equipment. The State will also effect a reduction in the subsidy paid, the sum being 155 million francs as against 180 millions paid to the former companies.

In the last seven years the air mileage covered by French services has grown enormously. In 1932 nearly 10,000,000 kilometres were flown (6,214,000 miles). A feature of the French services in recent times has been a commanding increase in speed. This year the introduction of the "Golden Clipper" type of air liner has enabled the French to claim record speeds, the London-Paris route being covered as a normal thing in 1 hr. 30 min. A record set up between the two capitals was 1 hr. 16 min. The "Golden Clipper" is a Loiret et Olivier three-engined low-wing monoplane, said to be capable of climbing fully loaded on two engines only, and maintaining height with one. It is of all-metal construction—including the wing coverings—and has a top speed of 165 m.p.h. and cruising speed of 140 m.p.h.

With a fleet of "Golden Clippers," connection is made with Switzerland from London in five hours, the South of France in seven hours, and Spain in nine hours. A particularly good view for the passengers over the low wing has been obtained by constructing the cabin floor relatively high in the fuselage. Releasable petrol tanks are another feature.

The main European services in detail operated by Air-France are as follows:—London-Cannes, via Paris and Lyons; London-Marseilles, via Paris and Lyons; London-Geneva, via Paris and Lyons; London-Lausanne, via Paris and Geneva; London-Zurich, via Paris and Basle; London-Barcelona, via Paris, Marseilles, Toulouse; Paris-Berlin, via Cologne; Paris-Berlin, via Frankfurt and Leipzig; Paris-Central Europe, via Strasbourg, Nuremberg, Prague, Warsaw, Vienna, Budapest, Belgrade, Bucharest and Sofia, thence to Salonika and Constantinople; Paris-Malmö, via Brussels, Rotterdam, Amsterdam, Essen, Hamburg and Copenhagen, in connection with K.L.M., Sabena, Scandinavian Air Express. Between London and Paris, Air-France maintain four services each way daily, including the newspaper machine, and the services into Germany, Holland and Scandinavia, Spain, Italy, etc., are also daily.



Another French machine—the Breguet 19 Commercial.

One requires a map of the world to obtain an impression of the wide network of the French air lines. Many of its European lines finally terminate on the other side of the globe. A weekly service each way is maintained between London and Saigon in French Indo-China, the single fare being £165. The air liners normally fly from dawn to dusk, leaving London each Wednesday and arriving at Saigon the following Thursday. The return journey commences each Sunday. Next spring the new three-engined Dewoitine monoplanes, with a cruising speed



Two more French types—the LeO-21 "Golden Ray" (left) and the latest Dewoitine D.332.



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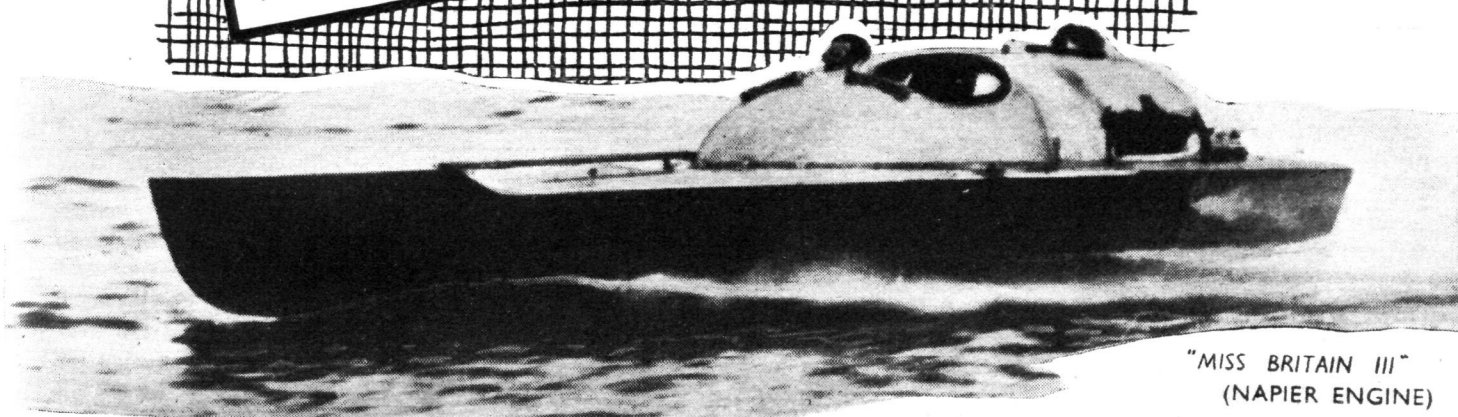
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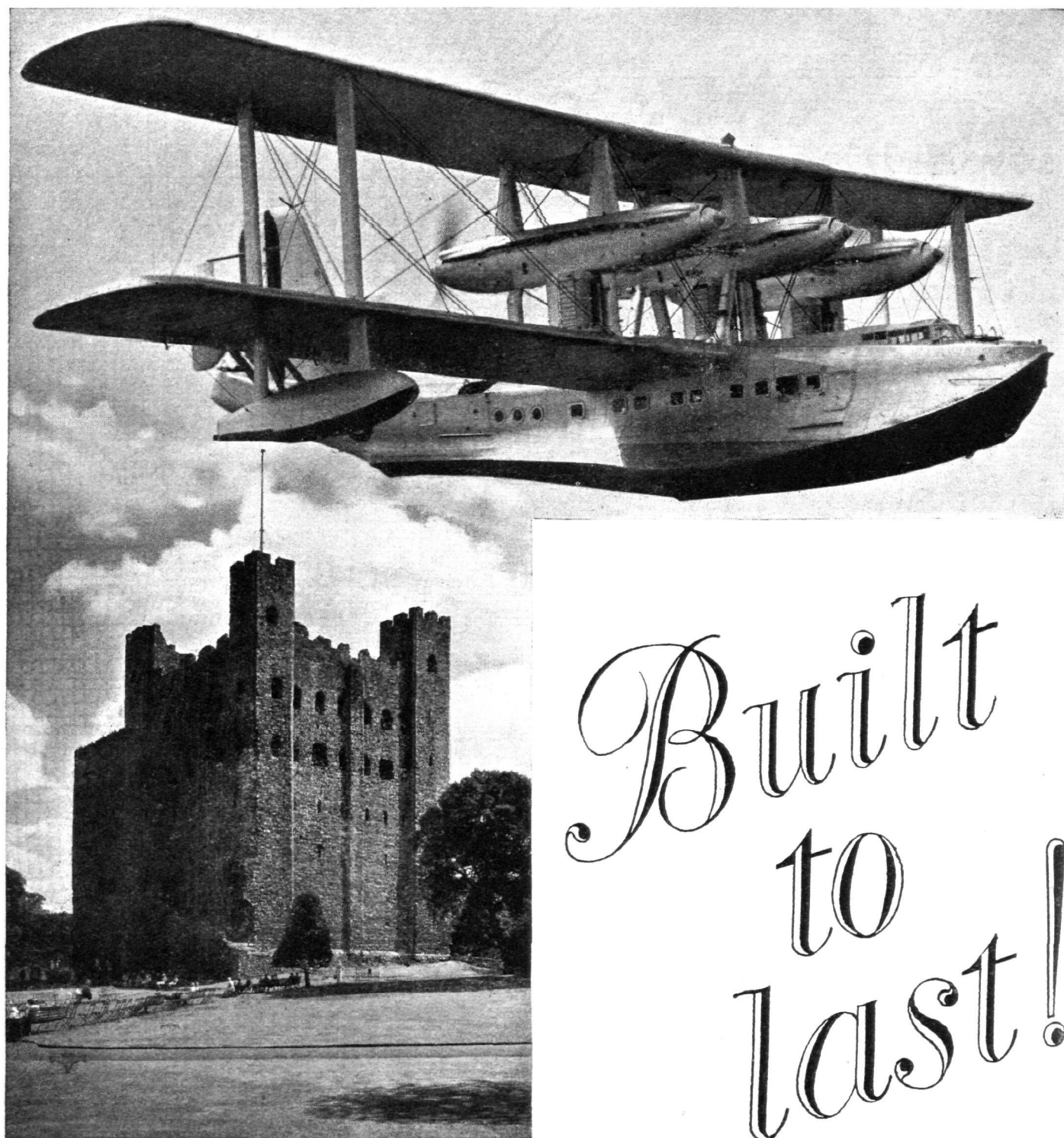
When shown the film, time a LOCAL STANDARD TIME which defied from British Standard Time by 10 hours. Chicago Standard Time by 12 hours. London Standard Time by 14 hours. The difference of 14 hours is due to the fact that the film was taken at 10.00 AM on the 21st of September 1933. The film was taken at 10.00 AM on the 21st of September 1933. The film was taken at 10.00 AM on the 21st of September 1933.



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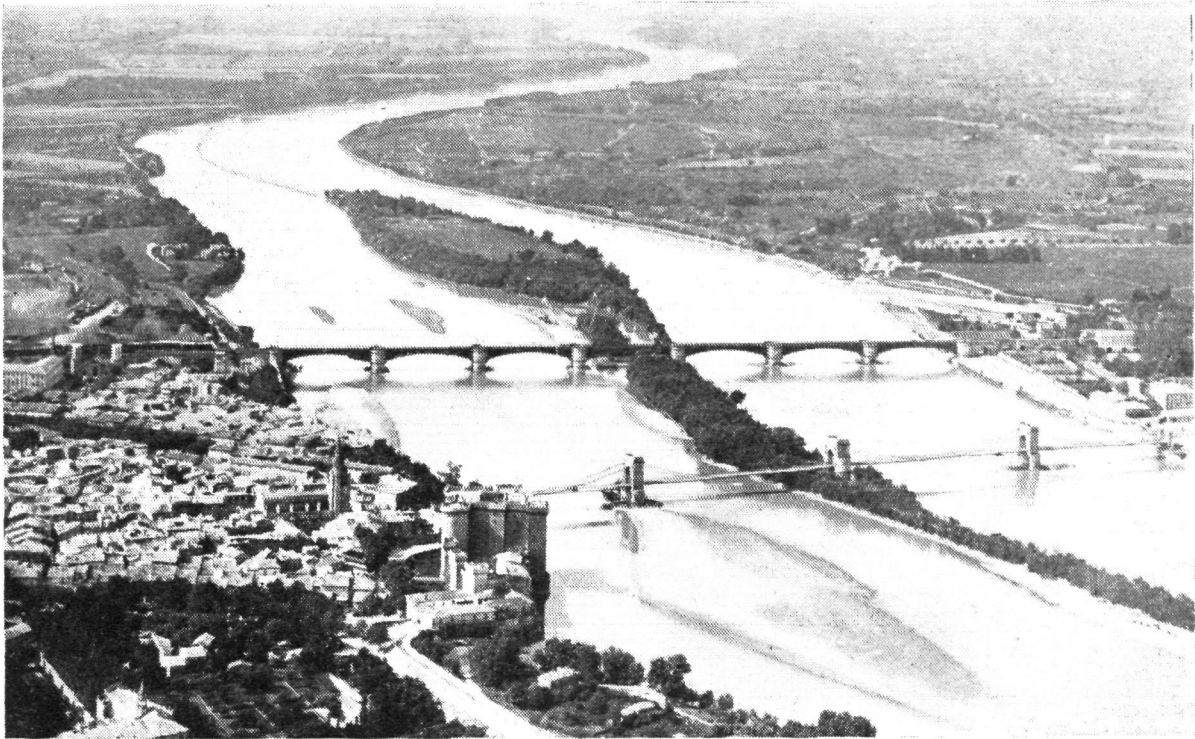
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Above the Rhône Valley, as seen from an Air-France airliner.

of 186 m.p.h., will be employed on this service, which will reduce the time between London and Saigon to 5½ days, the first stage being in all probability a non-stop flight to Athens. At present flying boats cover the route over the water between Marseilles and Beirut.

A mail and freight service from Toulouse to South America is one of the other ambitious air-links of Air-France, and although fast mail boats are used for the ocean crossing now, it is expected that the whole route will be covered by air in the near future. A return experimental flight over the route was successfully made this year in the Couzinet three-engined monoplane. Special types of aircraft are now being built for the future service to the order of the French Air Ministry.



The Wibault-Penhoët, another type used by Air-France.

#### GERMANY'S AIR SERVICES

DEUTSCHE LUFT HANSA, more commonly known as D.L.H., or just Luft Hansa, is the chief company operating in Germany, and their head office is in Berlin in the Lindenstrasse at No. 35. The General Manager is Herr Martin Wronsky. This company is the outcome of an amalgamation of all the main German operating companies which took place at the end of the year 1925.

Germany is probably more extensively covered with aerial services than any other country, and the list of services operated is a very imposing one.

(1) \*Berlin-Hannover-Amsterdam-Rotterdam (certain trips only)-London. (4) Berlin-Stettin-Danzig-Königsberg. (5) Berlin-Copenhagen-Malmö (in conjunction with Det Danske Luftfart Selskab A/S.). (6) Berlin-Cologne-Paris (with Air-France). (8) Berlin-Hamburg-Lübeck/Travemünde-Copenhagen-Göteborg-Oslo. (9) Berlin-Munich (with Avio Linee Italiane)-Venice-Rome (with Societa Aerea Mediterranea). (10) Berlin-Halle/Leipzig-Nürnberg/Fürth-Munich.

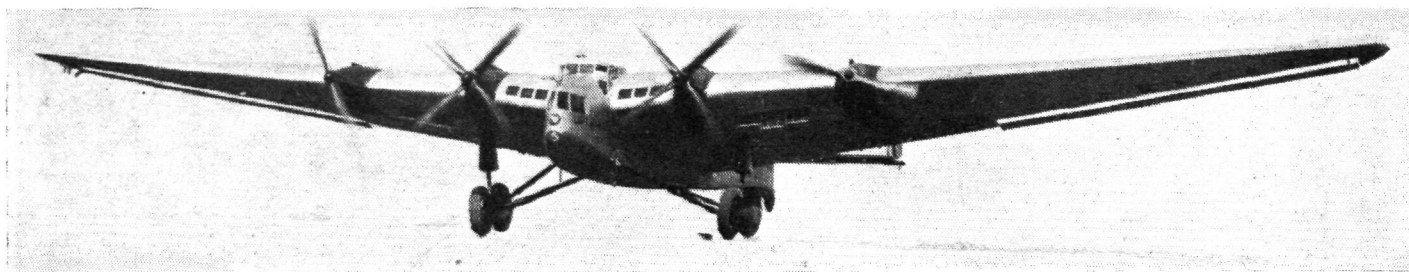
(11) Berlin-Frankfurt/M.-Saarbrücken-Paris (with Air-France). (12) Berlin-Breslau-Zürich-Berne-Geneva (with Swissair). (15) Berlin-Breslau-Gleiwitz. (17) Berlin-Vienna-Budapest-Belgrade-Sofia (with Österreichische Luftverkehrs A.G.). (22) Berlin-Marseilles-Barcelona. (31) Amsterdam-Essen/Mülheim-Cologne-Frankfurt/M.-Mannheim/Ludwigshafen/Heidelberg-Basle-Geneva (with Swissair). (32) Berlin-Dresden-Prague-Vienna (with Österreichische Luftverkehrs A.G. and Československa Letecká Společnost). (41) Budapest-Vienna-Salzburg-Munich-Zürich-Berne (with Österreichische Luftverkehrs A.G.). (42) Munich-Innsbruck-Bolzano-Trent-Milan (with Avio Linee Italiane & Österreichische Luftverkehrs A.G.). (45) Munich-Nürnberg/Fürth-Frankfurt/M.-Cologne-Düsseldorf-Essen/Mülheim. (46) Freiburg-Stuttgart. (49) Mannheim/Ludwigshafen/Heidelberg-Carlsruhe-Baden/Baden-Freiburg-Constance. (50) Giessen-Frankfurt/M.-Darmstadt-Mannheim/Ludwigshafen/Heidelberg. (52) Munich-Stuttgart-Mannheim/Ludwigshafen/Heidelberg-Saarbrücken. (53) Frankfurt/M.-Cologne. (81) Aachen-Cologne. (82) Krefeld-Cologne. (84) Düsseldorf-Essen/Mülheim-Osnabrück-Norderney-Borkum. (98) Düsseldorf-Cologne. (99) Amsterdam-Essen/Mülheim-Dortmund-Frankfurt/M.-Nürnberg (if required only)-Fürth-Munich. (101) Hannover-Erfurt-Nürnberg/Fürth-Munich. (102) Lübeck/Travemünde-Hamburg. (103) Cologne-Dortmund-Hannover. (104) Frankfurt/M.-Erfurt-Halle/Leipzig. (111) Bremen-Hannover-Halle/Leipzig-Chemnitz-Prague. (113) Bremen-Bremerhaven/Wesermünde-Wangerooze-Langeoog-Norderney-Borkum. (121) Hamburg - Hannover - Frankfurt/M.-Stuttgart - Friedrichshafen. (122) Hamburg-Magdeburg-Halle/Leipzig. (123) Hamburg-Kiel-Flensburg-Wyk-Westerland. (124) Lübeck/Travemünde-Kiel. (125) Hamburg-Bremerhaven. (127) Hamburg-Copenhagen-Malmö (with Det Danske Luftfart Selskab A.S.). (128) Hamburg-Kiel-Flensburg. (137) Berlin-Stettin-Stolpce-Danzig. (138) Berlin-Stettin-Swinemünde-Sellin-Stralsund-Hiddensee. (142) Düsseldorf-Dortmund-Erfurt. (147) Dresden-Berlin. (148) Halle/Leipzig-Chemnitz-Carlsbad-Marienbad. (155) Gleiwitz-Breslau. (156) Breslau-Halle/Leipzig-Cologne. (160) Breslau-Riesenge-



The Junkers Ju.52 3m., used by Deutsche Luft Hansa.

\* The numbers are Luft Hansa route numbers.





**A MODERN GIANT :** The four-engined Junkers G.38 type recently put into service by Luft Hansa. (FLIGHT Photo.)

birge/Hirschberg-Cottbus-Berlin. (162) Breslau-Prague-Munich.

Apart from these aeroplane services by the Luft Hansa A.G., there are also a considerable number of flights made each year to South America with the airship *Graf Zeppelin*. These flights start from Friedrichshafen, and Luft Hansa run connecting services from Berlin. The companies running this service are, besides the Luft Hansa; the Luftschiffbau Zeppelin G.m.b.H., Syndicato Condor Ltda., and Lloyd Aereo Boliviano. The route is Friedrichshafen-Pernambuco-Rio de Janeiro-Montevideo-Buenos Aires-Bolivia-Chile.

An "Aerobus" is run three times daily between Cologne and Frankfurt which, with the existing three services, makes six machines each way daily between these towns.

Certain services are also run for mails and goods only; these are:—PF 1.\* Berlin-Hannover-Cologne-London-PF 3. Frankfurt/M.-Cologne. PF 4. Amsterdam-Hannover-Copenhagen-Malmö (together with Det Danske Luftfart Selskab A/S. and A. B. Aerotransport). PF 6. Berlin-Vienna-Budapest-Belgrade-Sofia-Salonika-Athens.

All these Luft Hansa services are subject to a timetable. Some run every day of the week while others only run on weekdays, others again are only run during the summer months. It is impossible to go into full detail in this article, which is only designed to show the extent to which German aerial transport has developed.

Another company which did not combine with the Luft Hansa organisation is the Deutsche Luftverkehrsflug A.G. Their services are:—201/207.\* Dresden-Chemnitz-Plauen-Hof-Bayreuth-Nürnberg/Fürth. 210. Plauen-Zwickau-Chemnitz-Dresden-Leipzig/Mockau. 211. Plauen-Gera-Leipzig/Mockau-Dessau-Berlin. 212. Cottbus-Guben-Frankfurt/O.-Stettin. 250. Mannheim/Ludwigshafen/Heidelberg-Frankfurt/M.-Mainz/Wiesbaden-Cologne-Düsseldorf-Essen/Mülheim-Krefeld. 255. Stuttgart-Carlsruhe-Baden/Baden. 282. Dortmund-Borkum. 290. Krefeld-Cologne. 292.

\* These are route numbers.

Krefeld-Essen/Mülheim. 293. Düsseldorf-Cologne. The head office of this company is at the Fürth Airport of Nürnberg.

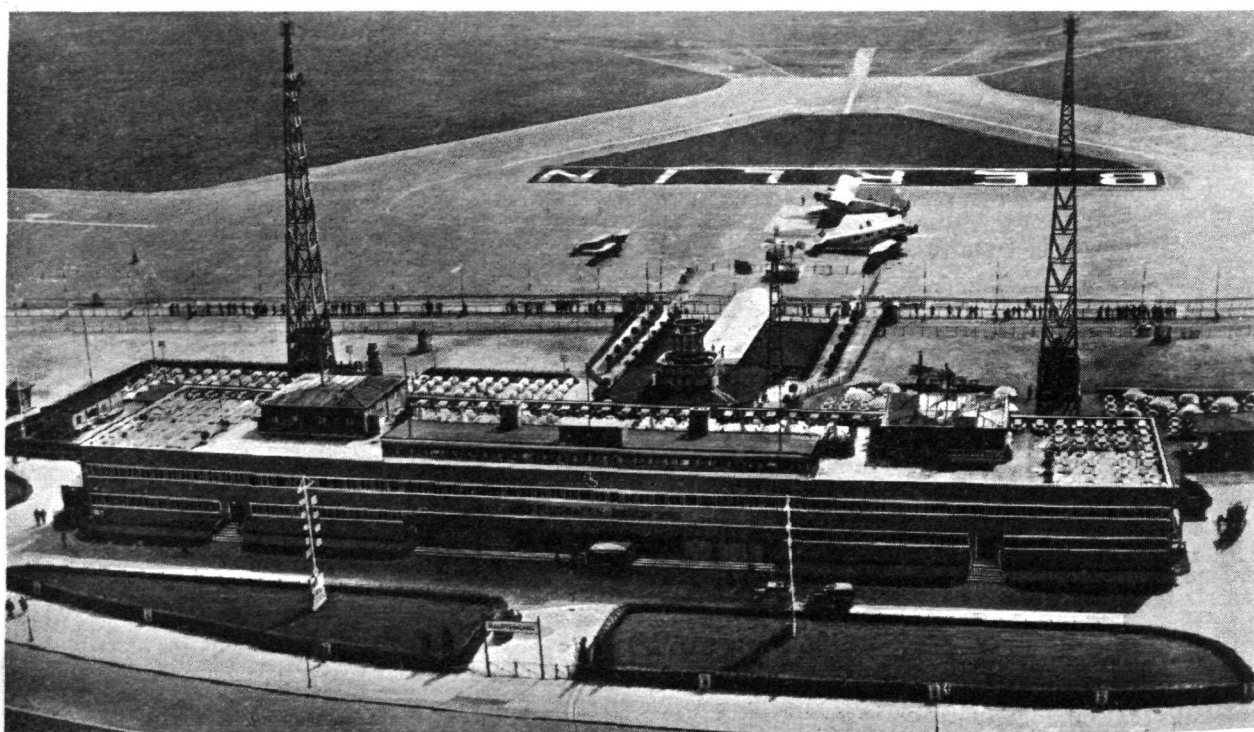
An interesting variety of aeroplanes are used by the German companies. Luft Hansa have:—Junkers G.38, G.31, G.24, Ju.52, F.13, W.33, F.24 KO., W.34, and also some F.13, W.33 and W.34 seaplanes; Rohrbach "Roland"; Dornier "Merkur," "Super Wal" and "Wal"; Fokker F.11 and F.111; Messerschmitt M.20 and two Heinkel seaplanes which are used for launching by catapult, with mails from the *Bremen* and *Europa* when these ships are some distance (up to as far as 700 miles on occasions) from Southampton and New York. By means of these aeroplanes the delivery of mails is greatly expedited.

Deruluft use Dornier "Merkur"; Junkers F.13; Rohrbach "Roland" and Russian machines, the ANT 9.

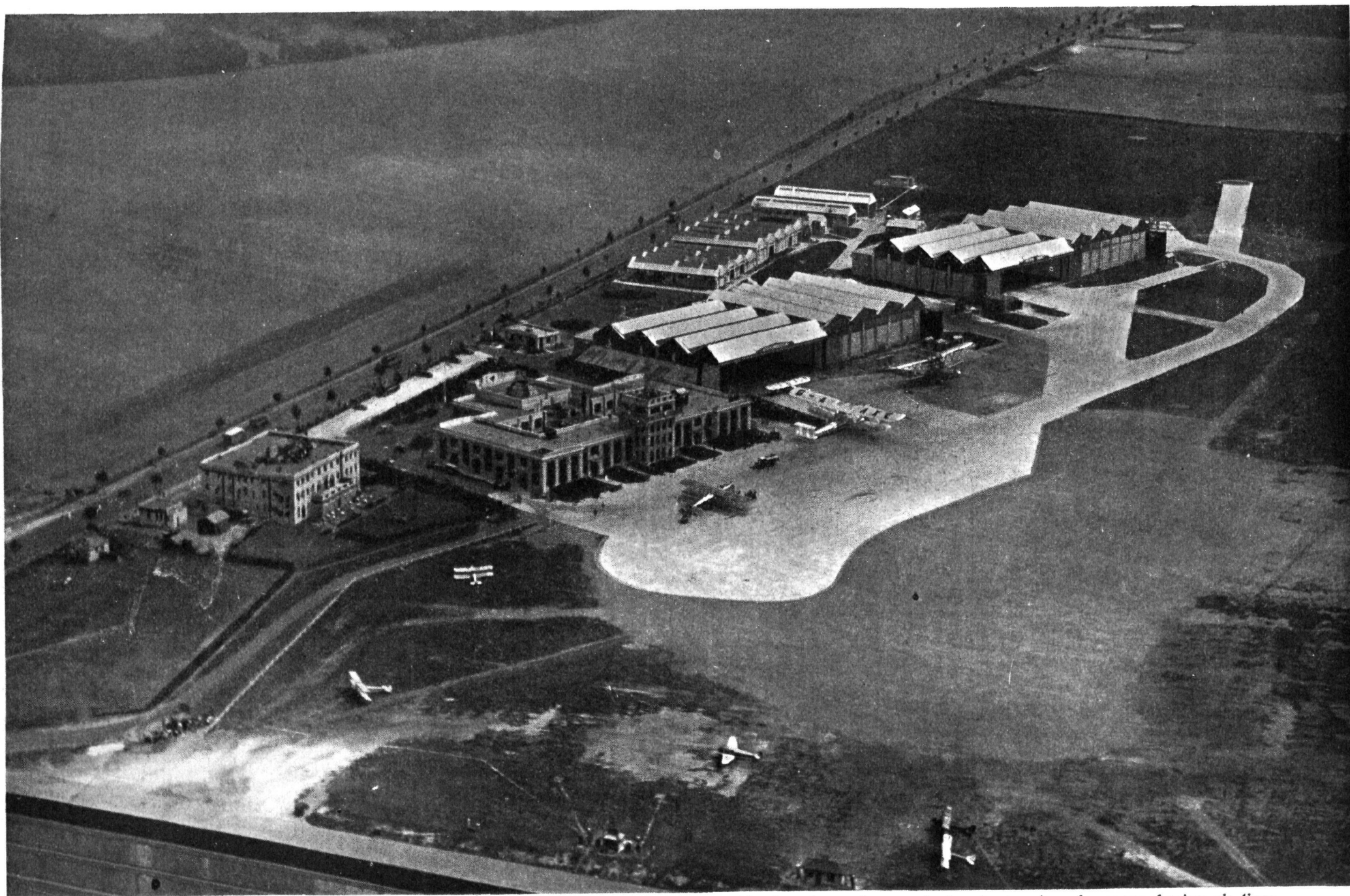
The Deutsche Verkehrsflug A.-G. use:—Messerschmitt M.18b, M.18d and M.24; and Focke Wulf A.32 and A.20.

#### GREAT BRITAIN

THERE is only one British company which is a member of the I.A.T.A., namely, Imperial Airways, Ltd. The geographical position and climatic conditions of Great Britain make it probable that she will always be more interested in external than in internal air services. Her chief pre-occupation will almost certainly be air services to and from other parts of the British Empire. This has been recognised by the Government, who have encouraged the formation of Imperial Airways with the object of running air lines to the British Dominions and Colonies. Two main Empire trunk lines are already in existence, one from Croydon to Capetown, and the other from Croydon to Calcutta. The latter will shortly be extended to Australia. The services are weekly in each direction. These services are not by air all the way. From Paris to Brindisi the mails and passengers travel by train through the night. The types of aircraft used on these services are:—From Croydon to Paris the Handley Page 42 with four Bristol



**BERLIN'S AIRPORT :** The Tempelhof Aerodrome.



CROYDON AIRPORT : The starting point for Imperial Airways' Continental and Empire air services, and also the terminus for many foreign air lines.  
(FLIGHT Photo.)





The Handley Page "Heracles" type, one of Imperial Airways' fleet. (FLIGHT Photo.)



Spartan "Cruiser" as used on internal air lines. (FLIGHT Photo.)

"Jupiter" engines; from Brindisi to Alexandria the Short "Scipio" flying boat with four "Jupiters"; for further stages in each direction the Eastern type of the Handley Page 42; and for the most southerly and easterly stages the Armstrong Whitworth "Atalanta" type with four Armstrong Siddeley "Serval" engines.

This article, however, is concerned with airways in Europe. It was only natural that the British air effort should start with services across the Channel to the Continent. Daily services to Paris started in 1919, and soon afterwards other services were instituted to Brussels, Amsterdam, and Cologne. Nowadays it is recognised that these early services could only be regarded as full-scale experiments through which experience could be accumulated as to how air services ought to be managed. Imperial Airways continues, none the less, to run services to various places on the Continent, and has built up a profitable traffic for them. In the early days the majority of the passengers were American tourists desirous of sensation and adventure. Now there is a genuine traffic of *bona-fide* travellers, who have found that air travel is not only the fastest way of getting about, but is also the most convenient in many respects. The volume of mail has also grown steadily, and certain classes of parcels (*e.g.*, jewellery and perishables) find very great advantages in air transport. The present services run by Imperial

machines go to Paris, Brussels, Cologne, and in summer to Zurich. Some of these services are run in co-operation with the Belgian air lines (Sabena) and the Deutsche Luft Hansa, which carry passengers, etc., on to various other towns on the Continent. The really amazing growth of traffic in recent years is very largely due to the fine reputation which Imperial Airways have established for safety, reliability, and comfort. They have pursued the policy of gradually increasing the size and capacity of their aircraft, and passengers almost invariably express themselves as delighted with the steadiness and absence of noise and vibration in the machines of the "Heracles," "Scipio," and "Atalanta" classes.

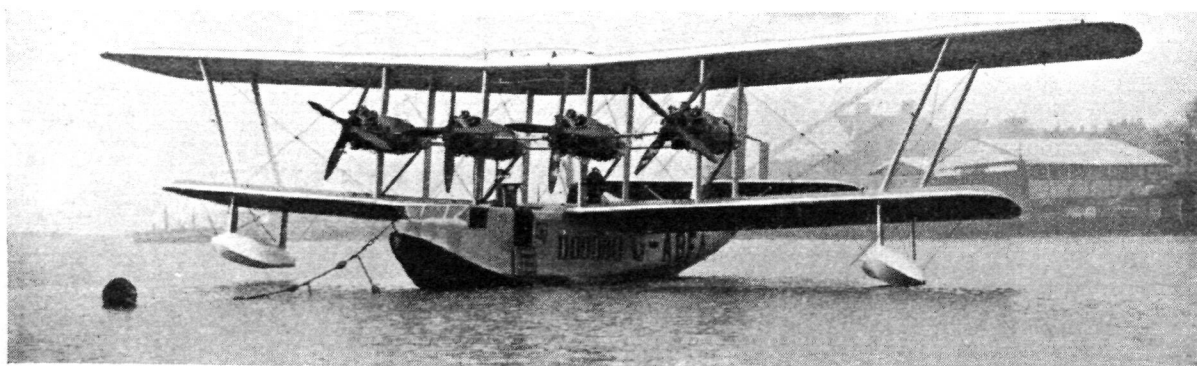
One is apt to think of the service of the "Scipio" flying boats as part of the Eastern services, as they are, in fact, intended to be. They may, however, justly be included in a survey of European air services. The boats start from Brindisi, fly to Athens, thence to Crete, and from there to Alexandria. Few more delightful trips can be imagined.

Internal air routes in Great Britain are of more recent growth. For a great part of the year the climate of the island is foggy. The distances are not great, and for the most part the ground services by train and motor coach are excellent. It would appear that air services across the Irish Sea ought to prove attractive, but some past experiments had not promised to be remunerative. None the less, quite recently a number of internal air lines have been opened. Special cases have come to light where air transport offers considerable advantages over ground transport, especially when stretches of water, such as the Bristol Channel, the River Humber, the Solent, and the Thames estuary, have to be crossed. The railways themselves have come forward in enlisting the aid of aircraft in certain such cases. The Great Western Railway has taken the lead by instituting an air service (operated by Imperial Airways) on the route Cardiff-Teignmouth-Plymouth, which has since been extended at the northern end to Birmingham. The following internal air lines have been operating during the past summer:—

Blackpool & West Coast Air Services, Ltd.—Blackpool-Liverpool.

British Amphibious Air Lines, Ltd.—Blackpool-Isle of Man.

Great Western Railway.—Birmingham-Cardiff-Teignmouth-Plymouth.



The Short "Scipio" flying-boat, this class being used by Imperial Airways on over-water routes. (FLIGHT Photo.)





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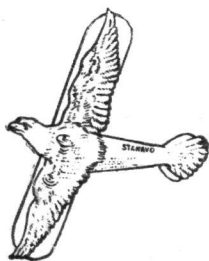
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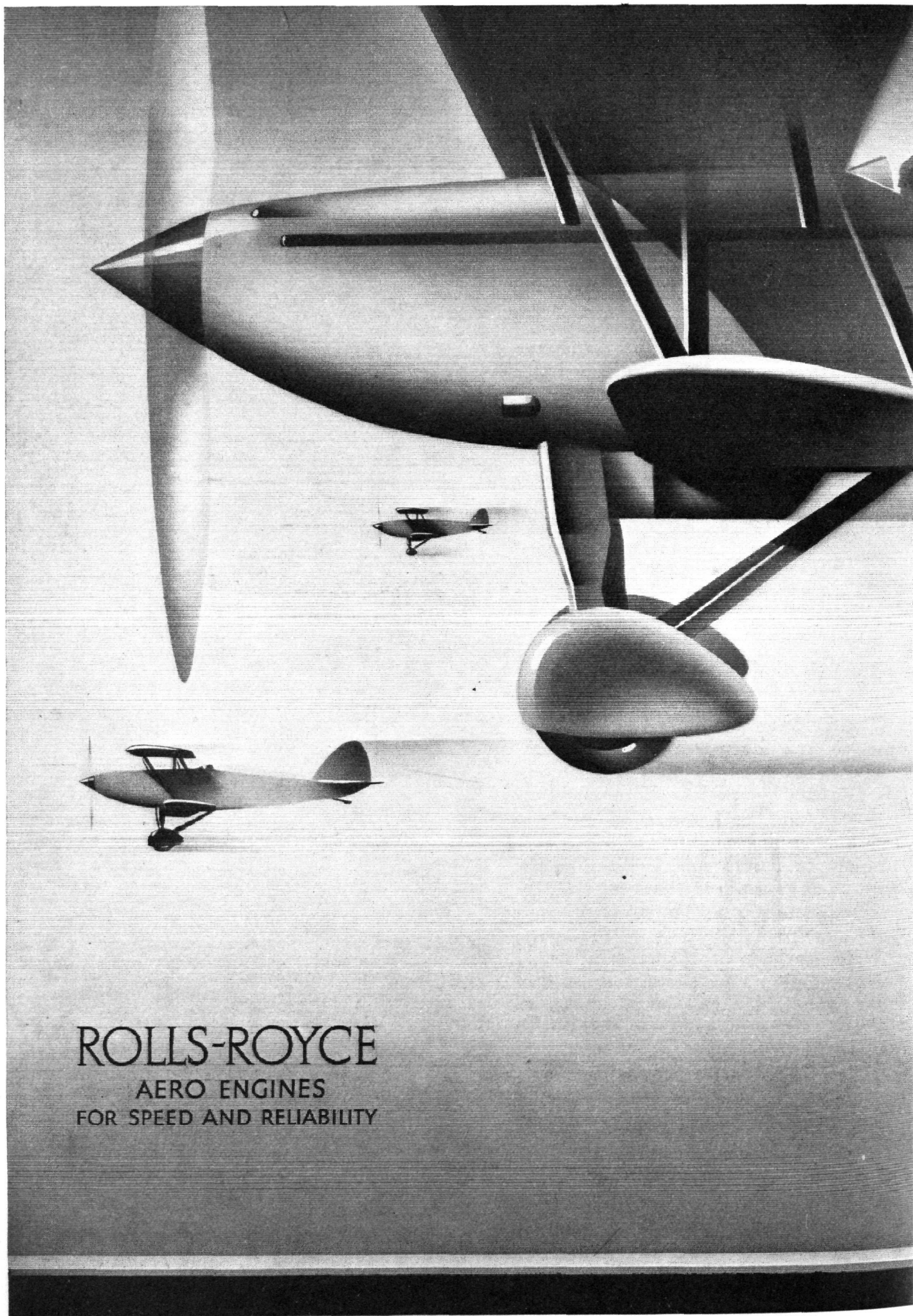
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The Armstrong-Whitworth "Atalanta," the latest class to be added to the Imperial Airways fleet. (FLIGHT Photo.)

Highland Airways. — Inverness-Wick—Kirkwall (Orkneys)—Thurso.

Hillman's Airways.—Clacton-Romford-Margate, London-Paris.

Midland & Scottish Air Ferries, Ltd.—Glasgow-Campbeltown-Belfast, with a branch Campbeltown-Bowmore (Islay).

Norman Edgar.—Bristol-Cardiff.

North Sea Aerial & General Transport, Ltd.—Hull-Grimsby.

Portsmouth, Southsea, and Isle of Wight Aviation, Ltd.—Shoreham-Portsmouth-Ryde-Shanklin.

Spartan Air Lines, Ltd.—Heston-Ryde-Cowes.

A very important factor in the development of internal air transport is the provision of a sufficiency of aerodromes and landing grounds. Some flying companies have provided their own aerodromes. In the main, however, it is hoped that municipalities will take the lead in establishing aerodromes, and many have already done so, or are considering doing so. The present position is given in the following list:

*Towns which have Licensed Aerodromes (16)*

Blackpool	Ipswich	Nottingham
Bristol	Leeds-Bradford	Plymouth
Cardiff	Liverpool	Portsmouth
Hull	Manchester	Renfrew
Inverness	Norwich	Stoke
		Southampton

*Towns which have Purchased Sites (4)*

Carlisle	Leicester	Walsall
Doncaster		

*Towns which have Reserved Sites in their Town Planning Schemes (11)*

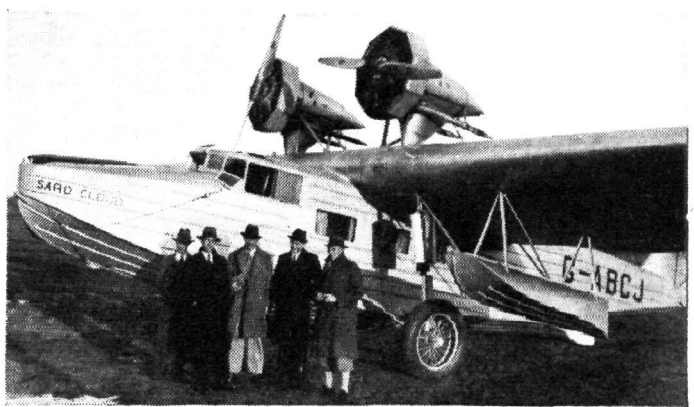
Basingstoke	Milton U.D.C.	Southwold
Blyth	Rotherham	Weston-super-Mare
Burton	Skegness	York
Maidstone	Southport	

*Towns which have had Sites Inspected (88)*

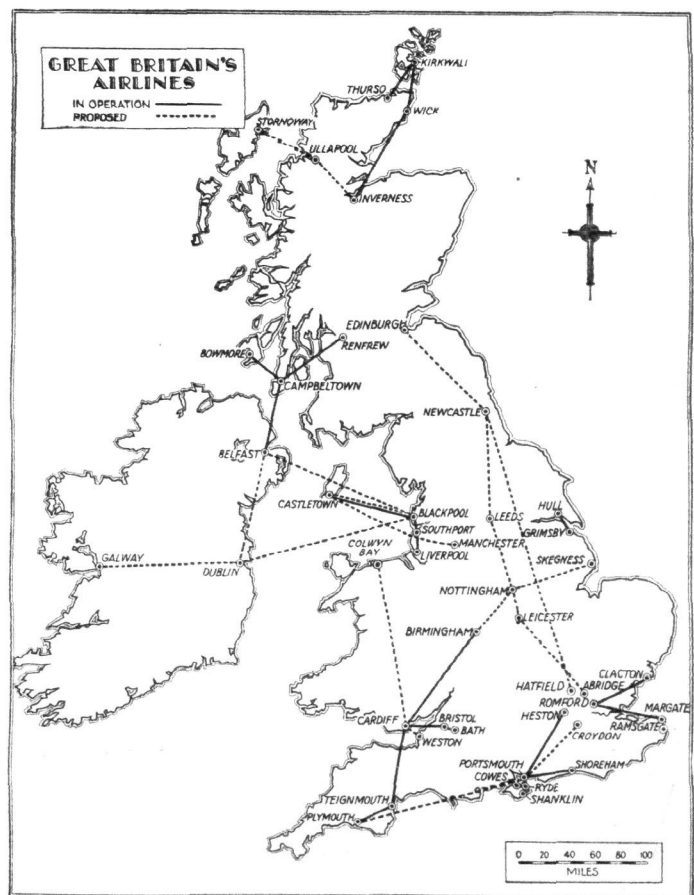
Abergavenny	Barnsley	Birkenhead	Cambridge
Aberystwyth	Bath	Birmingham	Cheltenham
Aberdeen	Bedford	Bridlington	Chester
Aldershot	Bexhill	Brighton-Worthing	Chorley
Aylesbury	Bognor	Belfast	Colchester
Barnet	Bournemouth	Burnley	Crewe



The Westland "Wessex," used for medium services by Imperial Airways, and some of the "Internal" operating companies. (FLIGHT Photo.)



Saro "Cloud" as used on internal air lines.



Sketch Map showing the internal airlines of Great Britain.



The Fokker XX, one of the latest types, with retractable under-carriage, produced for Dutch and other transport lines.

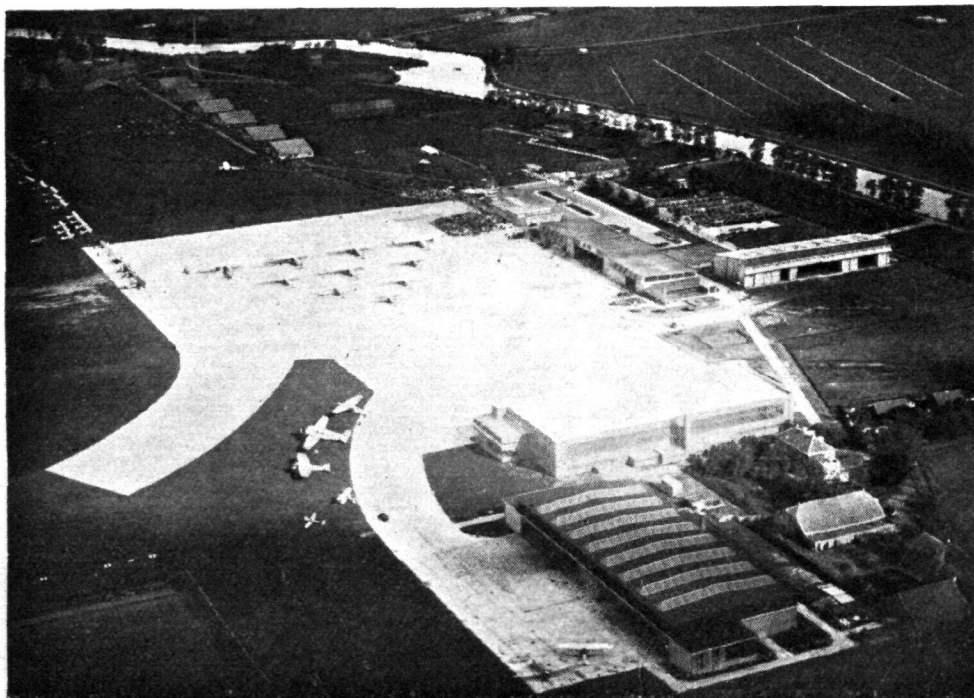
Derby	Middlesbrough		
Dundee	Middleton		
Eastbourne	Motherwell		
Edinburgh	Morecambe		
Exeter	Newcastle		
Falkirk	Newton Abbot		
Gateshead	Newport (Mon.)		
Glasgow	Northampton		
Grantham	Northam, Devon		
Greenock	Peterborough		
Grimsby	Poole		
Gt. Yarmouth	Rochester		
Gloucester	Southend		
Guildford	St. Albans		
Halifax	Scarborough		
Harrogate	Sheffield		
Hastings	Slough		
Harwich	South Shields		
Hereford	Stirling		
Huddersfield	Stratford		
Huntingdon	Swansea		
Huyton	Taunton		
Irvine	Tynemouth		
Isle of Man	Walthamstow		
Kidderminster	Warwick		
Leek	Weymouth		
Littlehampton	Winchester	Worcester	West Hartlepool
Lincoln	Windermere	Warrington	Wolverhampton
Lytham St. Annes	Woking	West Bromwich	Wellingborough

Towns which have Displayed Interest in Aerodromes other than Above (66)

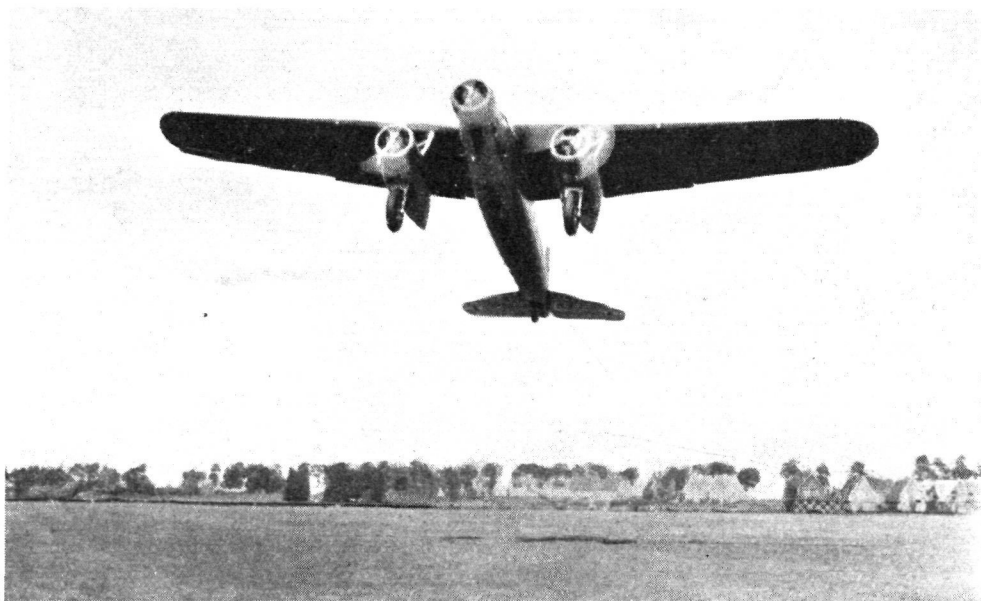
Airdrie	Hamilton	Pwllheli
Axbridge	Haywards Heath	Reading
Bangor	Haverford West	Redditch
Barrow	Henley	Redruth
Bideford	Kendal	Rochdale
Bolton	Kingston	Rugby
Buckie	Lancaster	Sunderland
Burry Port	Llandrindod Wells	Salisbury
Cannock	Loughborough	Shrewsbury
Caerphilly	Luton	Stafford
Chesterfield	Margate-Ramsgate-	Thornton, Lanes.
Colwyn Bay	Broadstairs	Truro
Coventry	Mablethorpe	Wadebridge U.D.C.
Cromer	Merthyr	Walton-on-Naze
Dagenham	Montrose	Wallasey
Darlington	Neath	Watford
Dornoch	Newtownards	Wigton U.D.C.
Dover	Nuneaton	Wrexham
Dunfermline	North Berwick	Winsford
Durham	Oxford	Witney
Folkestone	Perth	Yeovil
Gillingham	Pontypridd	
Gravesend	Preston	

## HOLLAND

DUTCH air lines have a deserved reputation for regularity and reliability. One could scarcely expect that a nation like Holland, with great maritime traditions,



Amsterdam, the Schipol Aerodrome, one of the K.L.M. airports.



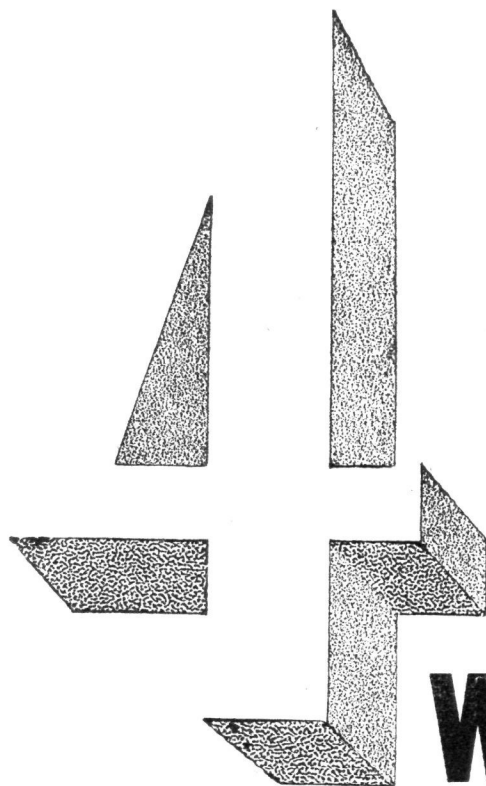
would fail to conquer the air, and it is not inappropriate that responsibility for operating the widest ocean route amongst those that diverge from Europe should be borne by the Dutch.

It is certainly a source of satisfaction that Koninklijke Luchtvaart Maatschappij voor Nederland en Kolonien N.V. (familiarily known as K.L.M. or the Royal Dutch Air Lines) should maintain a daily service direct across the North Sea between London and Holland with three-engined aeroplanes with a record for perfect safety. This water crossing, a distance of 100 miles, is accepted as a matter of course. K.L.M. is the only air line company operating in Holland, and has been established since 1919. K.L.M. services go north as far as Copenhagen and Malmo, east as far as Berlin, west to London, and south to Paris, but K.L.M. also co-operate with other air companies (Czechoslovakian Air Lines, Sabena, Deutsche Lufthansa, A.B. Aerotransport, and Air-France) to provide extensions beyond those termini, so that the traveller may be sure of flying to any of the big cities in Europe if his starting place is either Amsterdam or Rotterdam, two of the best equipped aerodromes in Europe. Certainly he will find the officials at those centres as accommodating as those of any other air-minded nation. The Dutch seem to possess the requisite personality for dealings with air travellers.

Holland itself, with its pattern of canals and dykes, always offers a unique and pleasant sight to the air traveller, although in winter, of course, those grey ribbons that thread the low land tend to cast an air of desolation.

A schedule of main K.L.M. European air lines is as follows: London - Rotterdam-Amsterdam; London-Malmo, via Amsterdam, Hamburg, Copenhagen; London-Berlin, via Amsterdam and Hanover; London-Praha, via Rotterdam, Essen/Mulheim, Halle/Leipzig; Paris to Amsterdam, via Brussels and Amsterdam.

Holland has its local air lines as well as its international services. There are regular services at certain periods of the year between Amsterdam and Twente, and Amsterdam and Groningen, and one linking Rotterdam, Haamstede and Flushing.



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The Waalhaven Aerodrome, Rotterdam, another of the K.L.M. airports.

Between London and Holland, K.L.M. operate at least three weekday services in both directions, while the Scandinavian Air Express, which travels via Holland, runs each way every day. From Croydon the direct service to Amsterdam takes about  $2\frac{1}{2}$  hr. or  $2\frac{3}{4}$  hr. via Rotterdam, about  $1\frac{1}{2}$  hr. being occupied by the flight across the North Sea from the mouth of the Thames. The longest air line in the world also begins in Holland, this being the K.L.M. weekly service to Batavia (where the subsidiary company K.N.I.L.M. operates air services in the Dutch East Indies), a distance of 9,000 miles, which is covered in ten days, beginning at each end on Thursday of every week. This important venture commenced in October, 1931, and at Bangkok a connection is made with the Paris-Saigon weekly air service.

As the home of the Fokker, Holland naturally places its faith in Fokker aircraft, but, of course, not for sentimental reasons alone. The latest type amongst these multi-engined monoplanes, which carry from 15 to 18 passengers, is the F.XVIII. Three-engined Fokker monoplanes manned by a crew of four are also the aircraft which cover the route to Batavia.



Italian flying-boats, Savoia S.66 class, a commercial version of the type used by Gen. Balbo on his Atlantic flights.

## ITALY

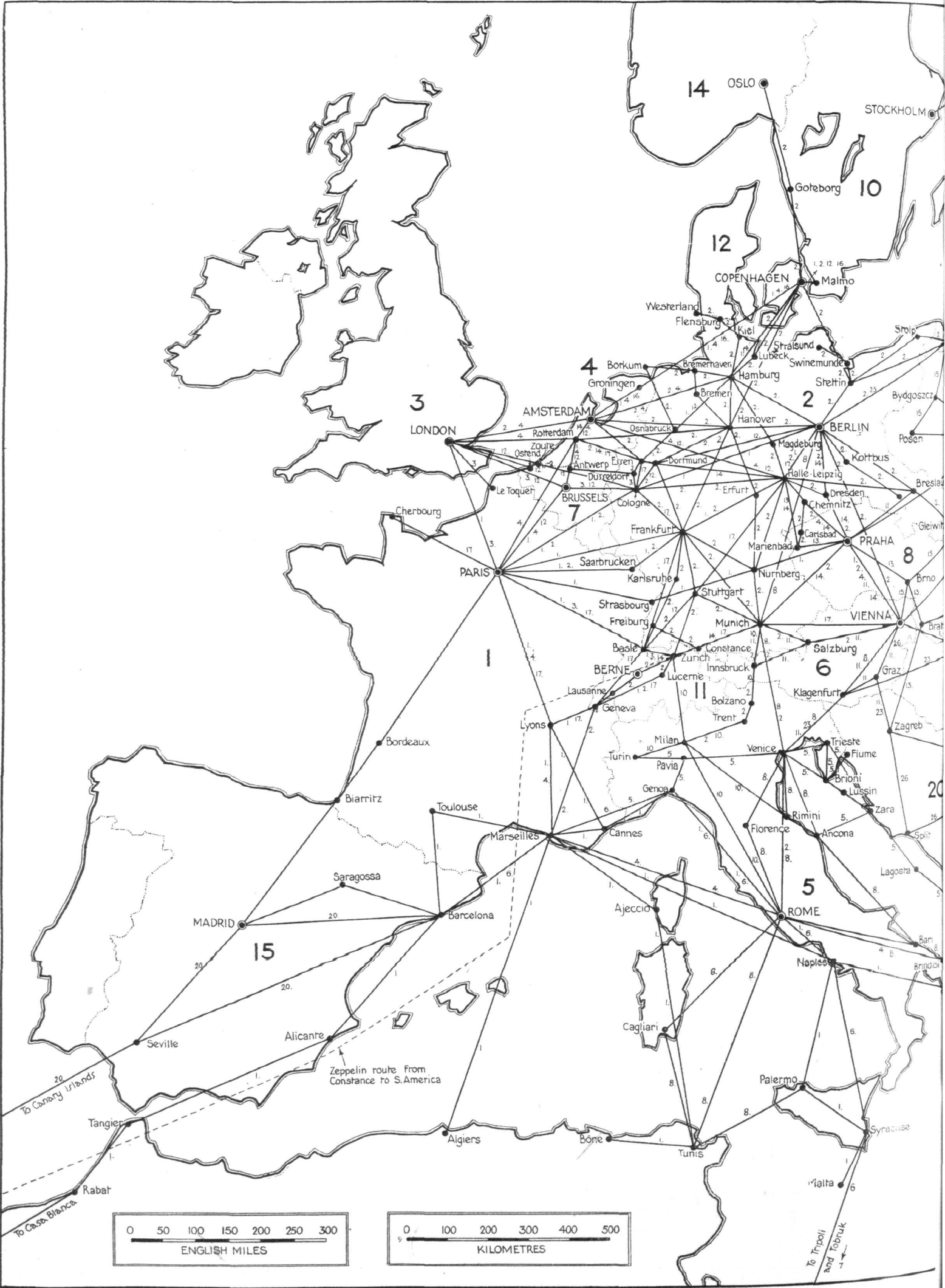
ITALY looms very large in the world of aeronautics, and her effort in the direction of civil air transport is worthy of her effort in other directions. Six important air line companies are at work, and their routes cover, not only the greater part of Italy herself, but stretch out to Berlin in the North, to Barcelona in the West, to Constantinople and Rhodes in the East, and to Tunis, Tripoli, and Tobruk in the South. The six companies and their main services are as follows:—

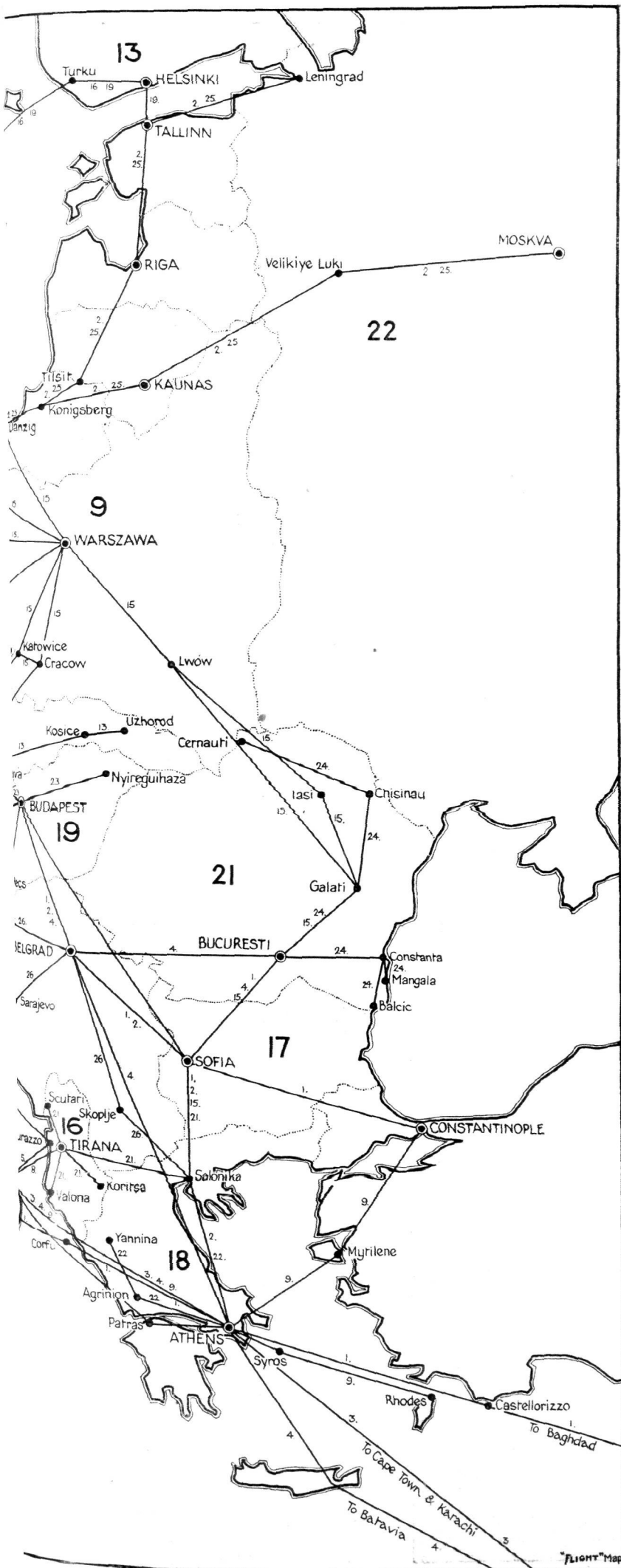
*Societa Italiana Servizi Aerei*.—Its headquarters are at Trieste. It is running four services at present. These are (a) Portorose, Trieste, Venice, Pavia, Genoa, Marseilles. The service runs daily except on holidays. (b) Portorose, Trieste, Zara, Lagosta, Durazzo, Brindisi. As the map which we publish shows, this is a useful line down the eastern coast of the Adriatic. It also runs daily except holidays. (c) Fiume, Brioni, Venice. Daily except holidays. (d) Zara, Ancona. A short service across the northern Adriatic, which links up the services which run down each coast. It runs daily except on holidays.

*Societa Anonima Navigazione Aerea*.—Its headquarters are at Rome, in the Via Torino. This company runs four services, namely (a) Rome, Genoa. Daily except holidays. (b) Rome, Genoa, Marseilles, Barcelona. This service runs on alternate days. Starts from Rome are made on Monday, Wednesday, and Friday. Starts from Barcelona on Tuesday, Thursday, and Saturday. (c) Rome, Syracuse, Tripoli. The service calls at Malta en route. Starts from Rome on Monday, Wednesday, and Friday. Starts from Tripoli on the alternate days. This service connects with the services of the next company, namely,

*Societa Anonima Nord-Africa Aviazione*, whose headquarters are at Benghazi in North Africa. This company has two services:—(a) Tripoli, Benghazi, and (b) Benghazi, Tobruk.

*Societa Aerea Mediterranea*.—Its headquarters are in Rome, in Via Regina Elena. It runs ten services, namely:—(a) Rome, Cagliari (in Sicily), Tunis. Daily except holidays. (b) Rome, Tunis, direct across the sea. On alternate days, leaving Rome on Monday, Wednesday, and Friday. (c) Palermo, Tunis. This service connects with the service of the Soc. An. Navigazione Aerea from Rome to Palermo. Passengers thus have a choice of three air routes back from Tunis to Rome. (d) Rome, Venice, Vienna. This is run, in co-operation with the Oesterreichische Luftverkehrs A.G. of Vienna and with the Deutsche Luft Hansa. Daily service. (e) Rome, Florence, Venice. Daily except holidays. (f) Venice, Munich. In co-operation with Deutsche Luft Hansa. (g) Munich, Berlin. In co-operation with D.L.H. (h) Venice, Ancona, Bari, Brindisi. Alternate days. Starts from Venice on Monday, Wednesday, and Friday. (i) Rome, Brindisi, Tirana (in Albania). (j) Rome, Aquila, Chieti, Pescara. A temporary service run on alternate days.





## KEY TO COUNTRIES AND AIR OPERATING COMPANIES.

### FRANCE (1)

**Air France**, the National Air Company of France, formed by the amalgamation of Air Union, Air Orient, Aeropostale, Farman and C.I.D.N.A. Routes 1.

### GERMANY (2)

**Deutsche Luft Hansa.** Routes 2.

### GREAT BRITAIN (3)

**Imperial Airways, Ltd.** Routes 3.

### HOLLAND (4)

**Koninklijke Luchtvaart Maatschappij voor Nederland (K.L.M.).** Routes 5.

### ITALY (5)

**Societa Italiana Servizi Aerei (S.I.S.A.).** Routes 5.  
**Societa Anonima Navigazione Area (S.A.N.A.).** Routes 6.  
**Societa Anonima Nord-Africa Aviazione (S.A.N.A.A.).** Routes 7.  
**Societa Aerea Mediterranea (S.A.M.).** Routes 8.  
**Societa Anonima Aero Espresso Italiana (S.A.E.I.).** Routes 9.  
**Societa Anonima Avio Linee Italiane (S.A.L.I.).** Routes 10.

### AUSTRIA (6)

**Oesterreichische Luftverkehrs A-G (O.E.L.A.G.).** Routes 11.

### BELGIUM (7)

**Societe Anonyme Belge d'Exploitation de la Navigation Aerienne (S.A.B.E.N.A.).** Routes 12.

### CZECHOSLOVAKIA (8)

**Ceskoslovenské Státní Aeroline (C.S.A.).** Routes 13.  
**Ceskoslovenska Letecká Společnost (C.L.S.).** Routes 14.

### POLAND (9)

**Polskie Linje Lotnicze (L.O.T.).** Routes 15.

### SWEDEN (10)

**Aktiebolaget Aerotransport (A.B.A.).** Routes 16.

### SWITZERLAND (11)

**Société Anonyme Suisse pour la Navigation Aérienne (Swissair).** Routes 17.

### DENMARK (12)

**Det Danske Luftfartselskab (D.D.L.).** Routes 18.

### FINLAND (13)

**Aero O.Y.** Routes 19.

### NORWAY (14)

**Norski Luftruter.**

### SPAIN (15)

**Lineas Aereas Postales Españolas (L.A.P.E.).** Routes 20.

### ALBANIA (16)

**Adria Aero Lloyd (A.A.L.).** Routes 21.

### BULGARIA (17)

No air operating lines.

### GREECE (18)

**Elliniki Eteria Enaerion Synghinonion A.E. (E.E.E.S.).** Routes 22.

### HUNGARY (19)

**Magyar Legiforgalmi Reszvenytarsasag (M.A.L.E.R.T.).** Routes 23.

### JUGOSLAVIA (20)

**Drustvoza Vazdusni Saobracaj A.D. (Aeropot).** Routes 26.

### ROUMANIA (21)

**Lignes Aériennes Exploitées par l'Etat (L.A.R.E.S.).** Routes 24.

### RUSSIA (22)

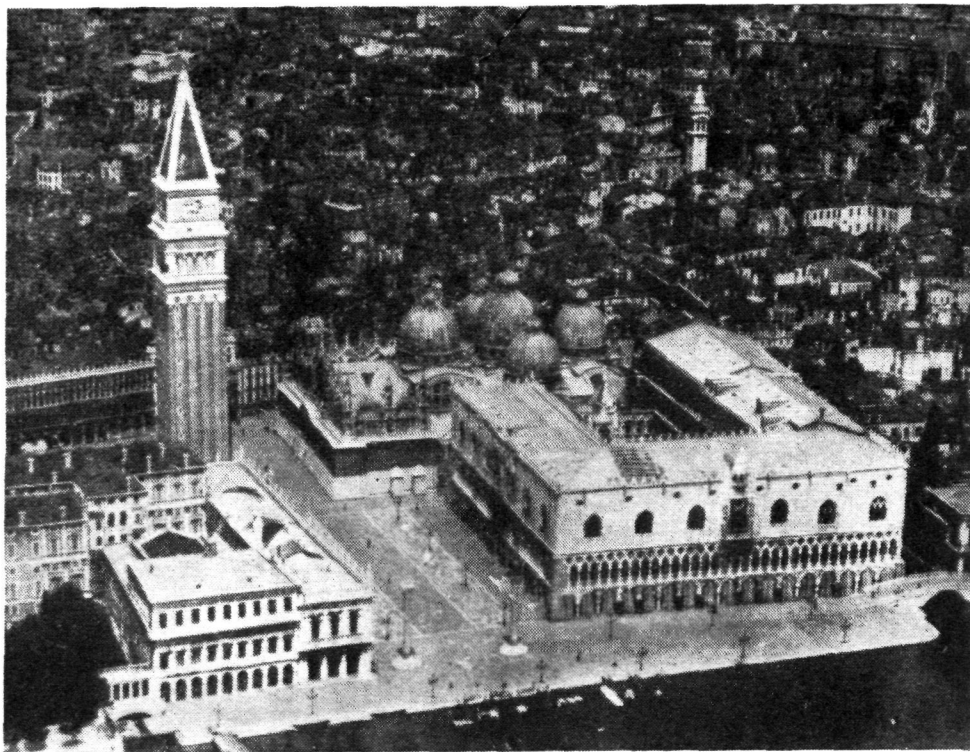
**Deutsch - Russische Luftverkehrs - Ges. (Deruluft).** Routes 25.



*Soc. An. Aero Espresso Italiana* has its headquarters in Rome, in Via Emilia. This company runs two services, both to Eastern Europe. (a) Brindisi, Athens, Constantinople. (b) Brindisi, Athens, Rhodes. Start from Brindisi on Tuesday; return on Thursday.

*Soc. An. Avio Linee Italiane*.—Headquarters at Milan, in Via Victor Hugo. This company runs five lines:—(a) Rome, Milan. Daily. (b) Milan, Trent, Munich. In co-operation with D.L.H. Daily service. (c) Milan, Turin. Daily except holidays. (d) Milan, Zurich. In co-operation with Swissair. Daily except holidays. (e) Milan, Rimini. A temporary service on alternate days.

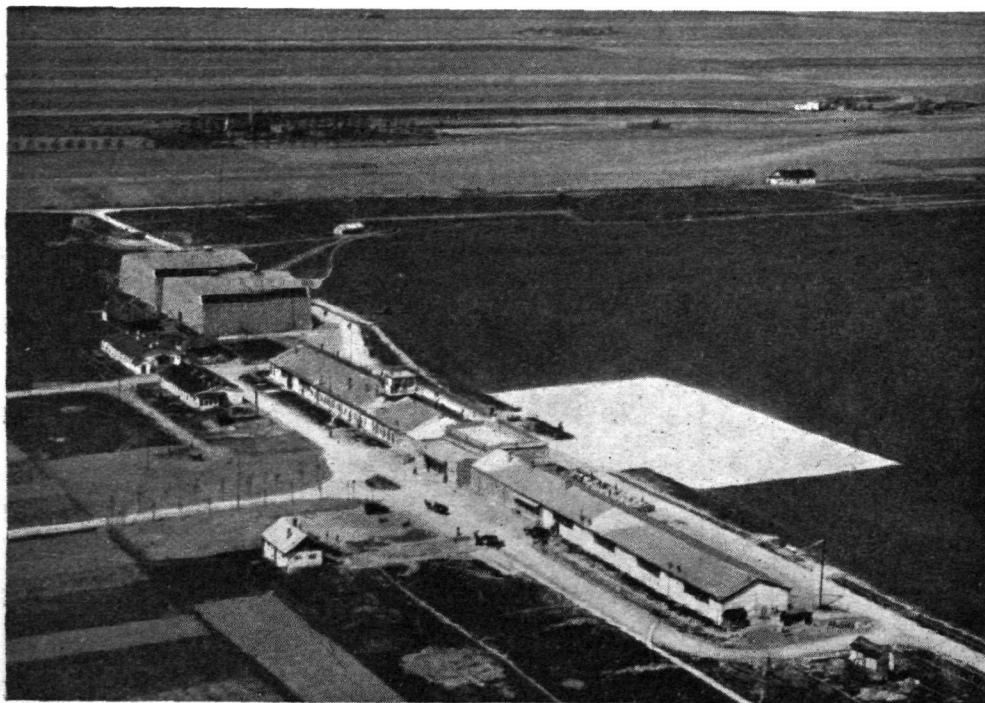
An aerial view of Venice, an important junction for Italian air services.



#### AUSTRIA

LIKE other Central European countries, Austria has numerous air lines passing over her territory. She has, however, one national air transport company—*Osterreichische Luftverkehrs A.-G. (Oelag)*, founded in 1923. Until 1925 it was a part of the *Trans-Europa-Union*, but since then it has been an independent concern, receiving a subsidy from the Austrian Government.

Oelag operates several services, passenger, mail and freight, mainly from Vienna—some independently and some jointly with outside air lines, such as *Luft Hansa*, *C.L.S.* (Czechoslovakia), *Aeropot* (Yugoslavia), *S.A.M.* and *A.L.I.* (Italy), etc. These services (subject to recent modifications) are as follows:—(a) Vienna-Praha-Dresden-Berlin, daily, except Sundays. (b) Vienna-Salzburg-Innsbruck-Munich-Zurich. (c) Vienna-Graz-Klagenfurt-Venice, thrice weekly service in conjunction with a thrice weekly service by *S.A.M.*, giving a daily service. (d) Vienna-Graz-Zagreb-Belgrade, daily (during summer). (e) Munich-Innsbruck-Bozen-Trent-Milan, thrice weekly (daily during summer). (f) Berlin-Vienna-Budapest (with *D.L.H.*) daily, except Sundays.



The machines used by Oelag are Junkers, type G.31 and G.24 three-engined, and F.13 single-engined.

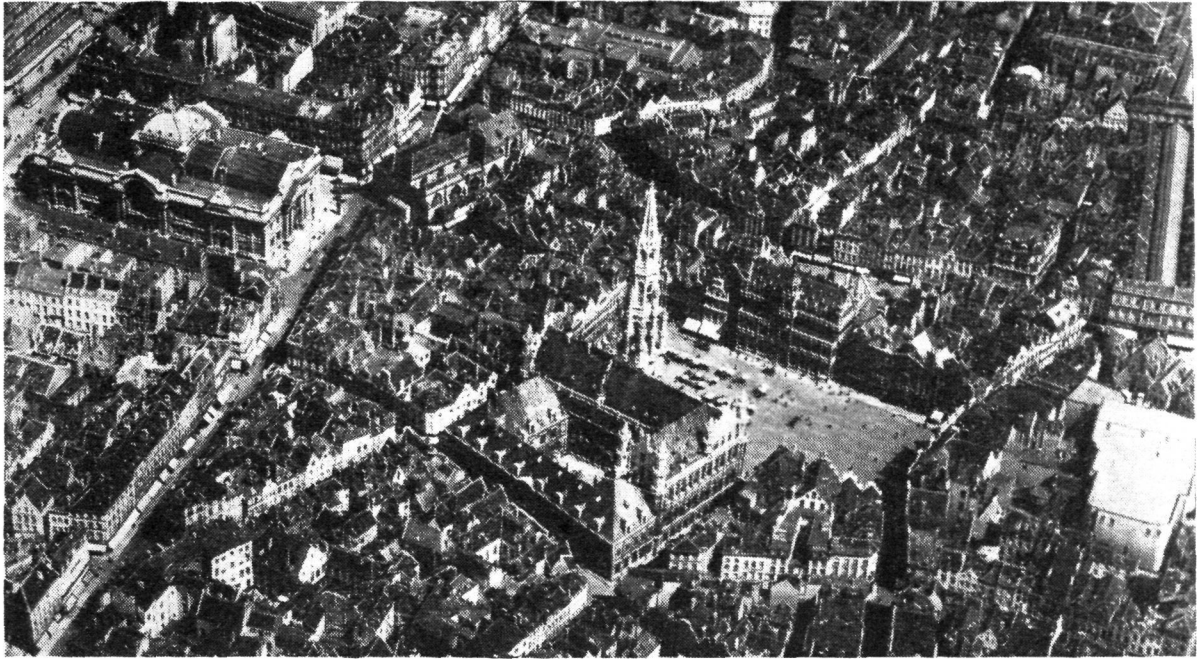
#### BELGIAN AIR LINES

*SOCIETE Anonyme Belge d'Exploitation de la Navigation Aérienne*, commonly known as *Sabena*, are in the happy position of claiming that for nine years they have operated extensive air services for passengers and freight without accident to either. Such a record alone establishes the reliability of the three-engined Westland "Wessex" and three-engined Fokker monoplanes, the aircraft comprising the fleet used. The Belgian Government share in the ownership of *Sabena*, which co-operates with *Imperial Airways*, *Air-France* and *Czechoslovakian Air Lines* in maintaining regular services between Belgium, Great Britain, Germany, Czechoslovakia, Denmark and Sweden.

A popular short route covered in the summer is between London and the Belgian coast, to resorts like Ostend and Le Zoute, arrangements being made with regard to period tickets, which make the service convenient to holiday-makers. For a little over £5, return tickets are available for fifteen or thirty days.

The chief *Sabena* services from Croydon to the Continent operate daily, including Sundays, the first machine departing from Croydon at the convenient hour of 9.10 a.m. at this time of the year. On weekdays only other air liners depart at 11.00 hrs. and 16.45 hrs., *Imperial Airways* being responsible for the mid-morning service. There are also three return services to Croydon, except on Sunday. The *Baltic Air Express* for passengers who wish to fly to Copenhagen and Malmö operates each way daily, including Sundays, departure from Croydon being at 9.10 a.m., and Malmö being reached at 17.00 hrs. From Malmö the air liner reaches Croydon at 18.45 hrs. Timetables naturally alter with the seasons, and the services we

The Aspern Aerodrome of Vienna, another aerial "Clapham Junction."



Brussels, as seen from a Sabena airliner.

mention are those being operated at the time of writing. When the short summer services to the Belgian coast close at the end of the season landings are made at Ostend by the ordinary main route liners on request.

One feature of the Sabena schedule for October is that of passengers for Brussels or Antwerp or Cologne happen to have a preference for travelling with Imperial Airways they can gratify it on Mondays, Wednesdays and Fridays, when I.A. run the service.

Sabena give all the comfort and luxury common to the best air lines to-day, and they guarantee safety as far as it is humanly possible by operating only three-engined aircraft, equipped with wireless for constant communication with aerodromes. There are special rates for children, 10 per cent. of the full fare being charged for juveniles under three, and half fare for those between three and seven.

The Belgian Congo, of course, is also a sphere of air development for Sabena, where all the chief towns are being linked. Plans have been devised for a service between Belgium and the Congo, and several instructive survey flights over the route have been made. It will certainly come into being in the near future. Incidentally Handley Page aircraft have played an extremely useful part in the pioneer flying in the Belgian Congo.

A schedule of the services operated is as follows: London-Dusseldorf, via Brussels, Antwerp and Cologne; London-Cologne, via Brussels and Antwerp; London-Malmö, via Brussels, Essen, Hamburg and Copenhagen, this service being the Baltic Air Express operated in conjunction with Imperial Airways and Air-France.

London-Prague, via Brussels, Essen, Halle/Leipzig, with, on Sundays only, connections at Essen to and from Dortmund and Berlin, these services being run in conjunction with Imperial Airways, Air-France and Czechoslovakian Air Lines.

#### CZECHOSLOVAKIA

OWING to its central position, Czechoslovakia is a fairly important country as regards air transport. Besides certain other European airlines passing over its territory, there are two main national air operating concerns. One of these is the Československé Státní Aeroline (C.S.A.), or Czechoslovak State Airlines, which, as its name implies, is a State-owned undertaking.

C.S.A. was founded in 1923, with headquarters in Praha, and operates the following routes, carrying passengers, mail and freight:—(a) Praha-Brno-Bratislava-Kosice-Užhorod. (b) Bratislava-Zagreb. (c) Praha-Karlovy Vary (Karlsbad)-Mariánské Lázně (Marienbad).

Traffic on the C.S.A. system has increased steadily year by year since its inauguration, after the first experimental service between Praha-Kosice in 1923. For instance, in 1924 the total number of kilometres flown and passengers carried were 207,000 and 426 respectively, as against 570,000 km. and 8,000 passengers in 1931.

The equipment used by C.S.A. is mainly of national construction, and includes the following:—Aero A35 and A38 (single-engined), Letov S.32 (three Walter engines), Avia F.VIb-3m. (Fokker licence), and Caproni Ca.97.

The other company is the Československá Letecká Spo-



Praha (or Prague), the modern part of the town built on the site of the old Ghetto. (Photo, courtesy Cedok, Ltd.)





Kbely Aerodrome, the airport of Praha.

lecnost (C.L.S.) or Czechoslovak Air Transport Co. This company is a private one, founded in 1927. It has headquarters at Praha and is subsidised by the State. C.L.S. operates the following routes:—(a) Praha-Dresden-Berlin (with D.L.H.). (b) Praha-Vienna (with Oelag). (c) Praha-Halle/Leipzig-Essen/Mulheim-Rotterdam-Amsterdam. (d) Praha-Maranské Lázně-Karlovy Vary-Chemnitz-Leipzig.

The machines used by this company include Avia-built Fokkers—F.VIIa single-engined and F.VIIb 3m. three-engined—Avia B.H. 25 single-engined.

#### POLAND

IN 1929 a limited company was formed in Poland named Polskie Linje Lotnicze (L.O.T.) to operate passenger, mail and freight air services, which previously were run by private companies. L.O.T., which is subsidised by the State, has headquarters at Warszawa, and operates the following services:—(a) Warszawa-Lwow-Cernanti-Galatz-Bucharest-Sofia-Salonika. (b) Warszawa-Danzig. (c) Warszawa-Poznan-Bgdgozez-Danzig. (d) Warszawa-Kattovice-Brno-Vienna. (e) Warszawa-Cracow-Kattovice.

These services are operated with the following types of aircraft:—Fokker F.VII and F.VIIb 3m., Junkers F.13, P.W.S.20 and P.W.S.24.

#### SWEDEN

THE first Swedish company to start operating in Sweden is the Aktiebolaget Aerotransport, the A.B.A., which was formed in 1924 with a Government subsidy up to the end of the year 1936. This company flies services between Stockholm and Helsinki, daily from June to September (return journey), with a halt at Abo during the months June to September; and between Malmö, Copenhagen, Hamburg, and Amsterdam, daily service May to October

(return). A fast night mail service is also operated between Gothenburg and Copenhagen, daily between June and September. The machines used by this company are Fokker FXII. (three engines) Junkers G.24, F.13, W.33 (three engines), and Junker ju.52 flying boat (three engines).

Owing to the popularity of the Amsterdam-Malmö service, it has been decided by the company concerned to use larger machines in the future. The new machines will be Fokker XXII powered by three Pratt and Whitney "Wasp" engines; these machines accommodate 21 passengers, and carry a crew of four, two pilots, one wireless operator and a steward. The cruising speed will be about 125 m.p.h.

In 1928 the Svenska Luftfartsforbundet (Swedish Air League) was formed with the object of promoting air transport in Sweden. It organised the first night air mail flights from Stockholm to London, which service has been maintained every year since, in co-operation with the A.B.A.

During the year 1932, the A.B.A. celebrated the carrying of its 100,000 passengers; also it has traversed a distance of 3,000,000 km. without a single mishap to any of the passengers.

Other companies which operate services to Sweden are the Deutsche Luft Hansa, the Lignes Aeriennes Farman, the S.A.B.E.N.A., the Finnish Aero O.Y., and the Danske Luftfartselskab A.S. All these companies operate their services so that their machines arrive at Malmö late in the evening, so that passengers may catch a night train express to Oslo and Stockholm; from the latter place they can proceed to Helsinki by air the next morning.

At the present time the Swedish Aeronautical Union are negotiating with Norwegian authorities for the establishment of air lines connecting Norwegian and Swedish towns, and as soon as the weather permits survey work will be started with the object of connecting up the towns in Northern Sweden with the capital.



Malmö Aerodrome, the principal airport of Sweden.



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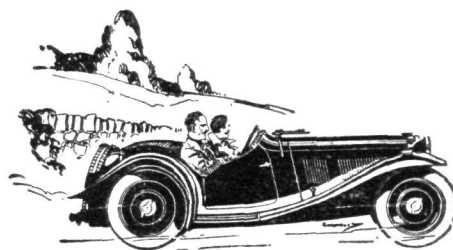
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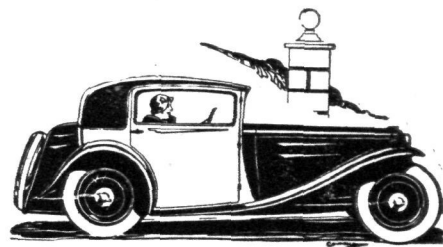
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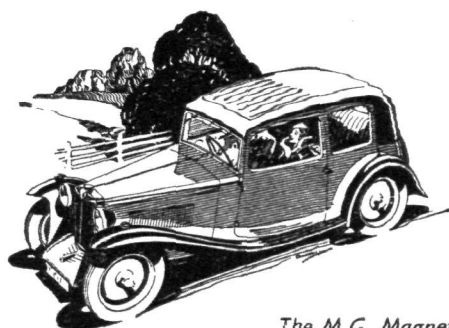


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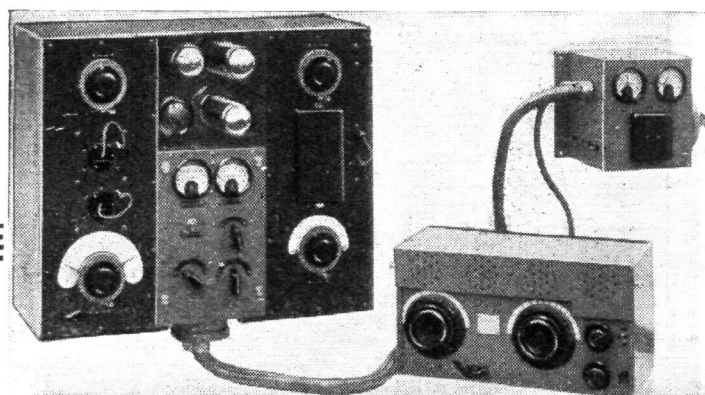


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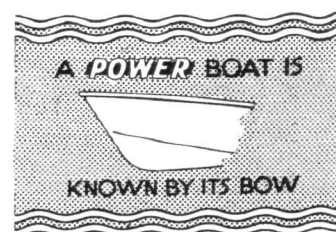
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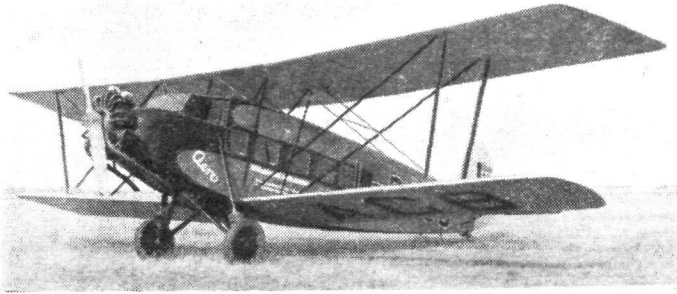
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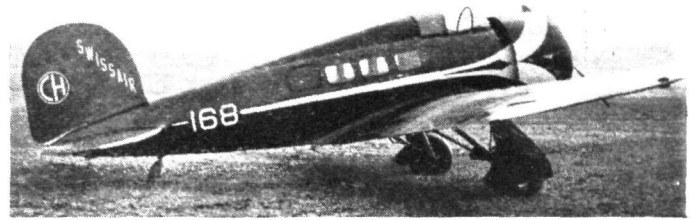


The Aero A.38, one of the Czech-built aircraft used by C.L.S.

#### SWITZERLAND

ITS modest place amongst the nations of Europe has not deterred Switzerland from providing the fastest air lines in Europe, purchasing foreign aircraft to achieve that distinction. The national air line company is Swissair, which was created by the amalgamation of two firms, Ad Astra-Aéro and Balair. Swissair set out to bring all the Balkan capitals within one day's air journey from Switzerland. Express connections have been made between Zurich, Basle, Berne, Geneva, and Lausanne, and from Vienna to Bucharest, Budapest, Belgrade, and Sofia. The air traveller can be back in Switzerland from any of those Balkan towns—after a stop of three hours in Vienna—within the twenty-four hours. The following are the services organised by Swissair—some, as stated, in conjunction with other air line companies: Geneva-Zurich, Munich, Vienna (with Deutsche Luft Hansa); Geneva, Basle, Mannheim, Frankfurt, Cologne, Essen, Amsterdam (with D.L.H.); Berne, Zurich, Stuttgart, Halle, Berlin (with D.L.H.); Basle, Zurich, Munich, Prague (with Czechoslovakian Air Lines Co.); Zurich, Basle, Paris (with C.I.D.N.A.); Geneva, Lyons, Paris (with Air Union); Lucerne, Zurich; Basle, Cherbourg, Le Havre (with Air Union and C.I.D.N.A.) (this is an air mail line only).

Swissair began their express services with Lockheed "Orion" monoplanes (575-h.p. Wright "Cyclone"), which have a top speed of 232 m.p.h. and cruising speed for normal progress of 161 m.p.h. With these American monoplanes the flying time between Zurich and Munich has been reduced from 1 hr. 55 min. to 1 hr., and Vienna is reached in 2½ hr. as against 4 hr. 55 min., which includes an intermediate stop at Munich of 10 min.



The Lockheed "Orion" used by Swissair on its high-speed services.

The latest type of American air liner to be added to the Swissair fleet is the Clark 43, manufactured by the General Aviation Manufacturing Corporation. It is a low-wing monoplane powered with the 700-h.p. Wright "Cyclone" F.I. Top speed is 190 m.p.h., cruising speed 170 m.p.h., and the cabin provides accommodation for ten passengers.

Alpar is the name of another company formed to operate air lines between Basle, Berne, Lausanne, Geneva; Berne, Biel, Basle; and, thirdly, Basle, La Chaux-de-Fonds, Lausanne, Geneva. The centre of operations is Berne.

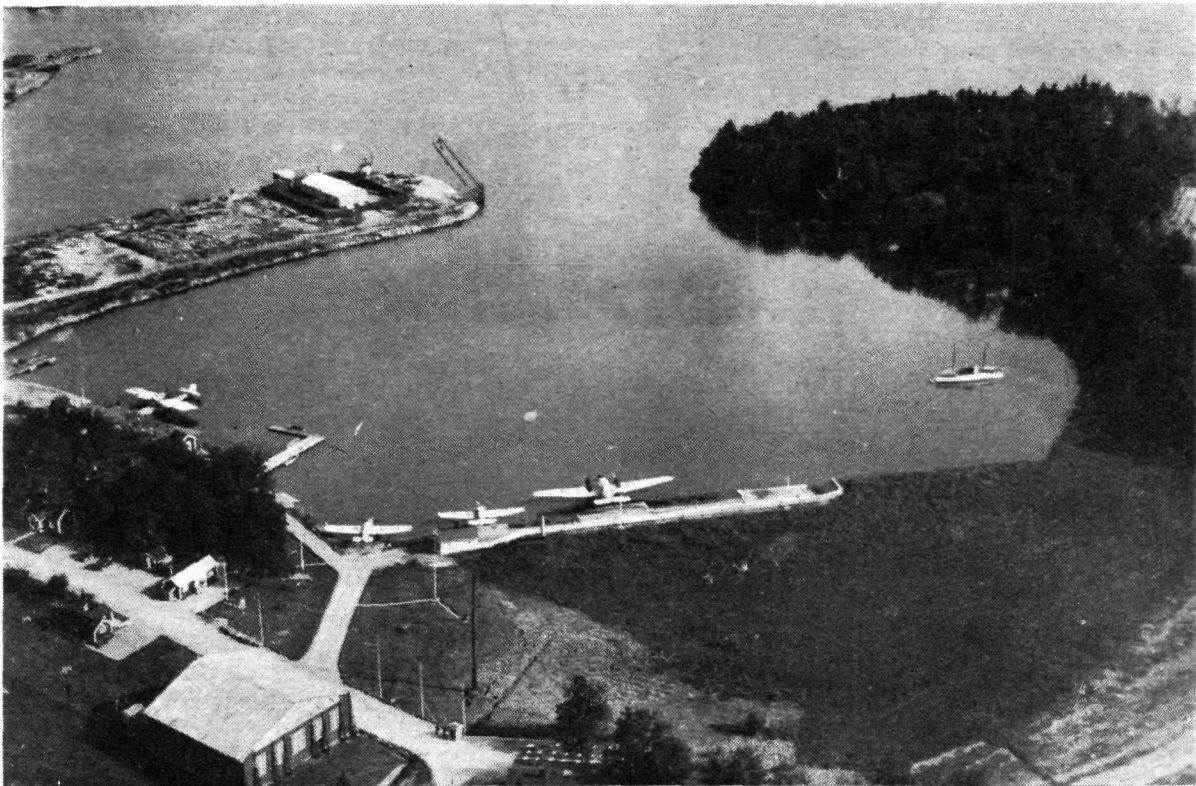
A service between Basle, Altenrhein (St. Gall) and Zurich has been run by a third concern, Ostschweiz Aero Gesellschaft.

#### DENMARK

THE bulk of the air traffic in and through Denmark is carried out by "foreign" air lines, such as Luft Hansa, A.B. Aero Transport, K.L.M., etc. A Danish company, Det Danske Luftfartsselskab (D.D.L.) was, however, formed in 1920, and with, we believe, the exception of a service between Copenhagen and Malmo, operates the Danish services in conjunction with the above air lines. The principal air services in Denmark are:—Copenhagen-Malmo; Copenhagen-Hamburg and Lübeck-Kiel-Flensburg-Wyk-Westerland. D.D.L. owns (or did, recently) some Fokker F.VIIa machines and a Desoutter monoplane.

#### FINLAND

AT the present time there is only one company in Finland operating an air service, the Aero O.Y., which is State subsidised, and works in conjunction with the Swedish Aerotransport. This company operates two regular services; one, from Helsinki, the capital town of Finland, to Abo, near Turku, and across the sea to Stockholm. This is a distance of about 275 miles, or



Stockholm Airport, which is used for seaplanes.



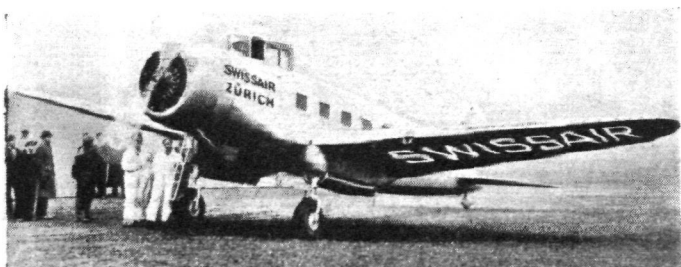


An aerial view of Oslo Harbour. Luft Hansa operate services to Oslo on behalf of the Norwegian Company.

which 175 miles is over the sea. A series of small islands, however, and the larger Aland Isles, considerably decrease the danger of forced landings. The other service is between Helsinki and Tallin in Esthonia, which is a short crossing of the Gulf of Finland, a distance of only about 50 miles. The first of these services is flown daily in summer and about twice a week during the winter, the other service daily throughout the year. The machines used are Junker low-winged monoplanes of two types; a large three-engined machine capable of carrying 14 passengers and a smaller single-engined machine which carries 4-6 passengers. A night service is also flown across to Stockholm for mails and freight only. Both these two types of machines are fitted with floats, which are exchanged for skis in the winter. The company has been in operation for eight years and has only experienced two accidents. Services to other parts of Finland may be opened next year, but owing to the number of internal lakes which are dotted about the country, seaplanes, fitted with skis in winter, will always be used. Helsinki is within 36 hr. of London, and there is an air service Croydon-Amsterdam-Copenhagen-Malmö; then, by night, a train journey to Stockholm, and first thing the next morning by Aero O.Y. to Helsinki.

#### NORWAY

**S**TRICTLY speaking, Norway does not, nationally, operate any air services, although since 1927 Luft Hansa has run a service between Oslo and Berlin, via Copenhagen, on behalf of the *Norske Luftruter*, a Norwegian concern. Dornier "Wal" flying-boats were used on this service.



The Clark 43, another American high-speed machine used by Swissair.

#### SPAIN

**T**HE geographical position of Spain marks her out as a country where various air lines must cross. The French lines for Northern Africa and for South America cross parts of Spain. So does the route of the German airship bound for South America. Italian lines stretch out their tentacles as far as Spain. Internally, however, Spain has not yet developed air lines to the extent which might have been hoped for from a country of her importance. One company is operating at present, namely, *Lineas Aereas Postales Espanolas*, whose headquarters are at Madrid, the address being Antonio Maura, 2. This company runs daily services from Madrid to Barcelona and back, and from Madrid to Seville and back.

#### ALBANIA

**U**P to 1927 the air lines in Albania were managed and operated by the *Deutsche Luft Hansa*. Then an agreement was come to which transferred the concession to Italy, and the *Adria Aero Lloyd* company was formed with headquarters at Tirana. The services are actually managed by the *Societa Aerea Mediterranea*. There are four services, namely:—(a) Tirana, Scutari; (b) Tirana, Koritza; (c) Tirana, Valona; (d) Tirana, Salonika, Sofia. This last service runs on alternate days, connecting with the S.A.M. service from Rome via Brindisi.

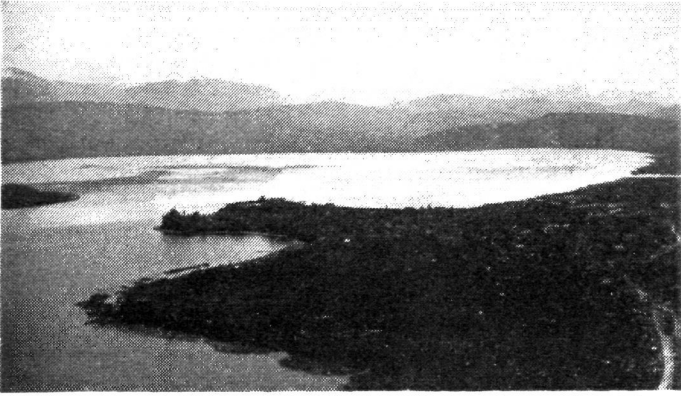
#### GREECE

**W**HEN the inevitable comes to pass and air transport is recognised as a matter of fact and not looked upon as an adventure, Zeus from the heights of Olympus, if, indeed, he still dwell thereon, will regard with awe and



One of the Junkers seaplanes used by Aero OY of Finland.





Jannina, the terminus of one of the Greek services.

wonder the many great birds, the work of men's hands, which desecrate with their noise the sacred celestial spaces of the air, wherein the gods have their spiritual habitation. It is to be hoped that he will not launch any of his celebrated thunderbolts in anger and indignation.

Greece, by very reason of its position, is bound to be an important centre for aviation, and Athens in particular, for from there machines will start the crossing of the Mediterranean Sea bound for Egypt, Syria, and Palestine, and beyond, South Africa and the East. Unfortunately, up to the present the vision of the Grecian Government has been blurred by economy, and subsidies have only been given grudgingly. Foreign companies which operate services through Greece are Imperial Airways on their lines to India and South Africa, the K.L.M. on their Amsterdam-Dutch East Indies line, the French Air Orient Co. on their Marseilles to Indo-China route, and Italian Aero Espresso which operates two services from Brindisi, one to Istanbul by way of Athens and the other to Rhodes, also by way of Athens. In addition to these, six countries fly services to Salonika, Germany (Luft Hansa); France (C.I.D.N.A.); Yugoslavia (Aeropot); Austria (Aeropot-Oelag); Poland (L.O.T.), and Italy (Societa Aerea Mediterranea).

Greece, by very reason of its configuration, its mountains, islands and the southern portion of it being separated from the rest by the Gulf of Corinth, is peculiarly in need of an adequate system of internal air lines. For instance, to get from Athens to Salonika, a distance of about 200 miles, takes 12 hr. by train and 20 hr. by sea; by air it takes 2 hr.; from Athens to Jannina, 210 miles, takes 30 hr., which has been reduced to just over 2 hr. by air, and from Athens to Agrinion, about 135 miles, takes 18 hr. by ground transport and about 90 min. by air.

In the year 1931 a company was formed under the name "Ikaros," which was later changed to Elliniki Eteria Enaerion Synghinonion A.E., or the Hellenic Communica-

tions Co., Ltd., more commonly known as the E.E.E.S. This company had as its object the linking of important towns in Greece by air. At the present time two services are operated, one from Athens to Salonika and the other from Athens to Jannina by way of Agrinion. The Athens-Salonika service is flown weekly, and the Athens-Jannina service weekly from January-August and from then to the end of the year four times a week, except during the last few months, when it is flown twice a week. A special postal service is also flown between Athens and Salonika twice weekly from January to September and weekly for the rest of the year. The company are also considering the possibility of starting services to Crete, Corfu and Egypt. The machines used are Junkers G.24 fitted with three Junkers L.5 engines, and Junkers W.33, one Junker 5 engine.

During the year 1932 414,010 km. were flown and 7,892 passengers carried, and the estimated efficiency of the services was 80-90 per cent. So, although the national effort is a comparatively small one, it is a very creditable one.

### HUNGARY

THE Hungarian Government follows the necessary general practice of awarding an annual subsidy to its chief air operating company, which is Magyar Legiforgalmi Reszvenytarsasag (Hungarian Air Traffic Co., Ltd.), of Budapest. This subsidy amounts to 200,000 Pengo (£7,189). The airport from which the company operates is Matyasfold, near Budapest, and services—running as a rule once in each direction daily—link the capital with Vienna, Pecs, Kaposvar, and Nyiregyhaza.

Twice-weekly services in each direction operate between Budapest and Klagenfurt, and Klagenfurt and Venice. The aircraft that have been employed are Fokkers, type VII, VIII, and XI, and Caproni 97.

Foreign air-line companies also operate in Hungary, namely, Osterreichische Luftverkehrs A.-G. Kepviselete (Austrian Air Transport Co., Ltd.), K.L.M., Compagnie Internationale de Navigation Aériennes and Deutsche Luft Hansa A.-G.

With aircraft Fokker VII, IIa, VIIb, VIIb3, VIII, Potez 29, 32, and Bernard I 190, the C.I.D.N.A. have linked Budapest with Vienna and Budapest and Belgrade daily except Sunday.

Deutsche Luft Hansa A.-G. have also run a service between Budapest and Vienna, and between Budapest and Belgrade, using Junker and Rohrbach aircraft. Austrian Air Transport Co., Ltd., provide yet another service between Budapest and Vienna with Junkers, which means that air travellers of French or Austrian or Hungarian or German nationality can patronise their own air lines if they so desire when flying between the two capitals.

K.L.M. have been responsible for a service every fifteen days between Budapest and Amsterdam with Fokker air



An aerial view of Budapest, showing the Parliament buildings.



FOR INTERNAL APPLICATION: Two representative types used on the internal airlines of Great Britain. The D.H. "Dragon" (left) and the "Monospar." (FLIGHT Photos.)

liners, improved to a once-weekly service each way at periods. A fortnightly service between Budapest and Athens has also been operated by K.L.M.

### JUGOSLAVIA

THE country of Yugoslavia, considering its youth, and the internal difficulties with which it has had to cope, is well advanced in matters aeronautical; quite a little network of air lines is spread over the country. Air transport was first introduced into Yugoslavia by the French Compagnie Internationale des Navigation Aeriennes (C.I.D.N.A.) in the year 1923, when it established its Orient line which passes through Belgrade. In 1927 the Yugoslav Air Navigation Co., the Aeroput, was formed to work in conjunction with the C.I.D.N.A.; this company was subsidised by the Government. In the year 1929 Aeroput came to an agreement for the running of a service between Belgrade, Zagreb and Vienna. In the following year negotiations were completed with the Greek Government for the extension of the Belgrade-Skoplje service to Salonika. In the summer of 1931 further services were introduced connecting Belgrade with Sarajevo, Split, Sushak, and Zagreb. The machines used by the company are Potez 29, fitted with 450-h.p. Lorraine engines, a Farman three-engined, and a D.H. "Puss Moth," which is used chiefly for taxi work.

The development of the Aeroput has been rapid. By 1930 the mileage covered had risen from 148,840 km. to 432,263 km., and the number of passengers carried had increased from 1,322 to 3,184; while the weight of mail transported had risen from 87 kgm. to 2,849 kgm., and that of freight from 7,010 kgm. to 25,604 kgm. The Yugoslav Aero Club has done much to foster aviation since the former was founded in 1922 under the patronage of H.R.H. the Crown Prince and the presidency of H.R.H. Prince Paul.

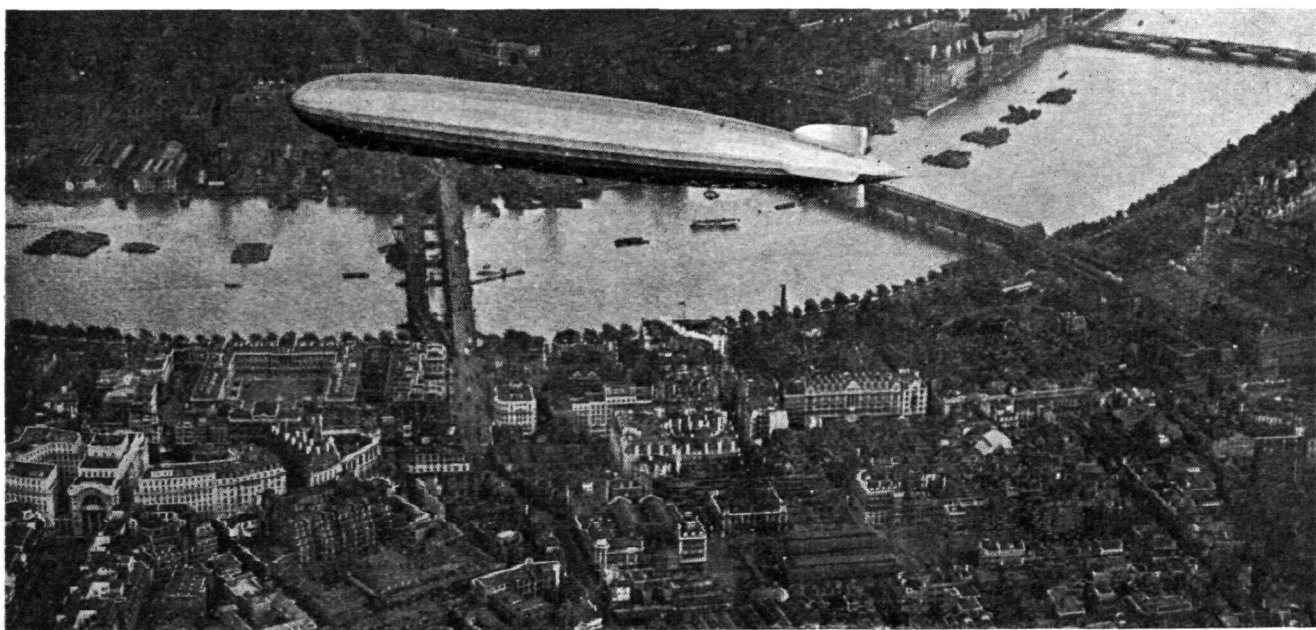
### RUMANIA

UP to 1930 civil aviation came under the control of the War Office, but it is now under the control of the Ministry of Commerce, through a section known as the "Directiunea Aviatiei si Navigatiunii Aeriene." The bulk of the air traffic previously fell on foreign lines—C.I.D.N.A., etc.—but now the State-owned company, Lignes Aeriennes exploitees par l'Etat (LARES) runs several services in Rumania, viz.:—Bucharest-Galati-Chisinau-Cernauti. Bucharest-Constanta-Mangalia-Balcic. The Lares fleet includes Junkers F.13 monoplanes and Avia B.H.25.

### RUSSIA

EUROPEAN air lines that link up with Russia's extensive internal air connections are operated by Deruluft, Russian German Air Operating Co. of Berlin. One main service by Deruluft links Berlin with Moscow via Danzig, Konigsberg, Kowno and Weliklje Luki, and another links Berlin with Leningrad via Danzig, Konigsberg, Tilsit, Riga and Tallinn (Reval). The intervening countries thus crossed and connected by these lines are East Prussia, Lithuania, Latvia and Estonia. These services are in operation daily, including Sundays. Deruluft is subsidised by Germany and Soviet Russia and was founded in 1921. The company's capital was subscribed and paid in equal parts by the U.S.S.R. Government and a German holding company. To convey an idea of the extent to which these two lines to Russia are patronised, in 1930 there were 2,390 passengers, and in 1931 3,079.

Amongst the fleet of aircraft employed have been Dornier-Merkur (single-engined), Junkers F.13 (single-engined), Rohrbach-Roland (multi-engined) and the Ant 9 (multi-engined).



LIGHTER-THAN-AIR: Graf Zeppelin, seen here flying over London, has operated numerous services between Germany, Spain and South America. (FLIGHT Photo.)



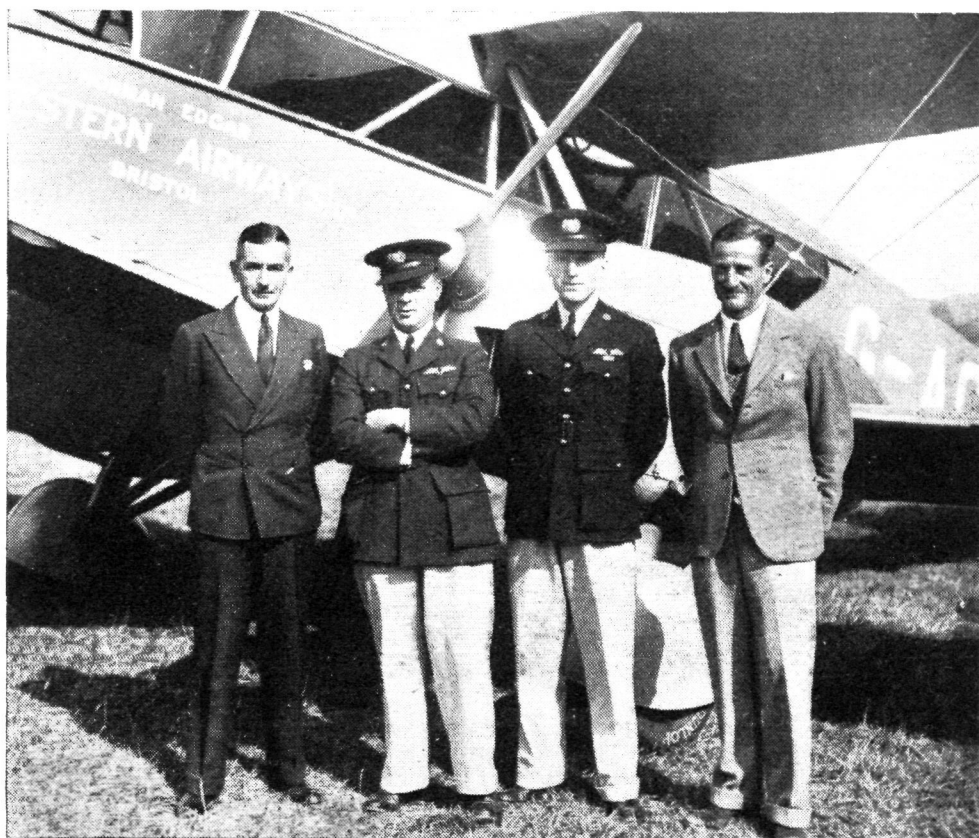
# From the Clubs

## A PLEASANT AFTERNOON AT BRISTOL

**F**OUL weather is almost proverbial at all shows which the Bristol and Wessex Aeroplane Club get up. This tradition was, however, broken on Saturday, September 16, on the occasion of their annual "Garden Party." It was a perfect day, and the spectators could hardly have had pleasanter conditions for such a meeting.

Why it was called a Garden Party is difficult to understand. True, it was not a public flying meeting, although the enclosures were very wisely thrown open free of charge to the public. Mainly it was a club occasion when members could bring their friends and see a little very pretty flying, but the true Garden Party, atmosphere, with tea on the lawn and post-Ascot dresses, was absent. In view of the weather this was a pity. However, a large number of spectators came for the afternoon, and undoubtedly enjoyed themselves.

The flying programme was commendably brief, but what there was of it was good. There was an arrival prize which was won by Mr. C. S. Napier, the most recently appointed Director of the Cirrus-Hermes Engineering Co., Ltd., who flew down in his remodelled Hendy 302, wherein he starts his "Hermes IV" engine with the Caple electric starter. Flt. Lt. Hall, the Club's chief instructor, did some pretty aerobatics on one of the club "Moths" ("Gipsy I"), and then a certain number of aeroplanes calculated to interest



**ENTERPRISE :** Western Airways find that traffic for their service between Cardiff and Bristol is growing rapidly. They are now using this "Dragon." Mr. Norman Edgar is on the left with Messrs. C. R. Cubitt and G. W. Monk, his pilots, next to him. Lt. Col. D. B. Gray, on the right, is a new Director of the firm.

people were demonstrated. The Miles "Hawk" ("Cirrus III") was flown by Mr. S. Cliff, of Phillips & Powis, Ltd., who build this machine at Reading; a D.H. "Dragon" (two "Gipsy Majors"), which is now run by Norman Edgar (Western Airways), Ltd., on the Bristol-Cardiff ferry service, followed the "Hawk," and a "Fox Moth" from the same service followed that; seen at odd times there was also an ancient Parnall "Pixie," whose Bristol "Cherub" engine seemed quite capable of giving it an interesting performance; a notable absentee was the Westland "Wessex" (three "Genet Majors"), this useful commercial machine, the new version of which we described last week, and is particularly suitable for feeder and line work, is built at Yeovil, and therefore in its own country when it appears at Bristol. People who go to flying meetings are so used to seeing open two-



**FOR ACCURATE FLYING :** The Hon. H. C. Bathurst receiving a set of A.A. flying maps from the Chairman of the Club, Mr. A. H. Downes-Shaw. This was the prize for the landing competition, and was presented by Capt. A. G. Lampugh, of the British Aviation Insurance Co. Behind are Capt. C. D. Barnard (no hat) and Mr. R. Ashley Hall. The latter worked hard at the microphone all the afternoon. He was in his element, as he spends most of his time singing the praises of the Airport, and is largely responsible for its development.





THE "GARDEN" PARTY: An A.S.T. "Cadet" flying over the club enclosure.

seater aeroplanes that they are apt to forget that flying can be as comfortable as motoring if done in a closed machine like this and the "Dragon." Both these aeroplanes are now being used extensively on short air line work in this country, and the better they are known to the public the quicker will that public take to using them regularly. Yeovil, that is, the Westland Aircraft Works, was not, however, quite unrepresented, as one of the "Wallace's" from No. 501 (City of Bristol) (Bomber) Sqd. came over from Filton, and the noise of its Bristol "Pegasus" engine contrasted with the tones of the light aircraft engines. Talking of which reminds us that there seems to be a growing tendency to omit the use of long exhaust pipes or silencers. Light aircraft with stub exhausts are an abomination to their owners and to the people on the ground, and all designers ought to think very seriously before marketing machines in this condition if they want, not only their own machines, but all aeroplanes in general to become popular.

Flt. Lt. J. B. Veal, an instructor from the Air Service Training School at Hamble, put up an excellent aerobatic display on one of his school's Avro "Cadets" ("Genet Major"). He was naturally hampered by not having a fuel system which permitted his engine running when inverted, but nevertheless his was a most finished and clean display. His rolls were particularly noticeable as being about an absolutely straight axis, while his showmanship was far better than that of many pilots who give these displays. This is a point which is frequently overlooked by pilots, but Flt. Lt. Veal took good care to do all his manoeuvres so that everyone could see them.

Messrs. T. W. Campbell and W. L. B. Palmer, of the Bristol Aeroplane Co.'s flying school, then went up in two "Tiger Moths" ("Gipsy Majors"). One represented a pupil, and a pretty poor one at that, and the other as instructor. The latter first did a manoeuvre as it should be done, and the former showed what happened when it was done as it ought not to be done. An excellent display, which included a great deal of skilful flying.

The Bristol and Wessex Model Aero Club flew their models, and most interesting they were. A point which struck us was the gentle way these models landed after making quite extended and most stable flights. Models always used to nose dive into the ground when they came down, but many of these sat down so gently that their propellers continued to run after landing. There is undoubtedly a great deal to be learnt from model building, and we hope that this club which has grown from a membership of three in February this year to 32 at the present time will

maintain its liason with the Bristol and Wessex Aeroplane Club.

Two competitions formed part of the programme. The first was a landing competition for Club members. This was won by the Hon. Henry C. H. Bathurst, who is a F/O. in No. 501 Sqd. The second was a bombing competition for visiting pilots, each competitor being allowed three shots, with four bags, at a target on the aerodrome.

We cannot close without reference to something at Bristol which could with advantage be copied by other clubs, and that is the signposting of the way through the City to the Airport. It does not matter from what direction you arrive at Bristol you will have no difficulty in following the admirably placed A.A. signs which lead you straight to Whitechurch. Incidentally the new arterial road has made access to the Airport very easy indeed, and given reasonably clear traffic it is only a quarter of an hour's drive to the centre of the City. Comparisons are, we know, odious, but perhaps in this case those responsible at Portsmouth will take it in the right way if we draw their attention to the difficulty which is always experienced by those who try to follow the signs which are to be found, if one looks hard enough, leading to their Airport. These signs are of nondescript colour, and so placed that they are missed by most people. As the route to that Airport is somewhat complicated, the authorities would do well to take a leaf out of Bristol's book.

On the following day, Sunday, teams from the club played other teams at Squash Rackets, Tennis and Golf. The results being:—

#### GOLF

The Aero Golfing Society lost 9 games to 1 to the Bristol and Wessex Aeroplane Club at Burnham.

G. C. Brooks beat A. J. Wallace Barr 4 and 3.

F. Love beat A. Irwin 2 and 1.

R. Arnott beat Brian Lewis 2 up.

L. Arnott beat Brian Allen 4 and 2.

E. M. Savory beat C. Darwin 3 and 2.

I. Tratman lost to E. Fulford 6 and 5.

D. C. Love beat H. E. Perrin 1 up.

H. C. H. Bathurst beat C. D. Barnard 4 and 3.

A. H. Downes-Shaw beat W. R. Massey 6 and 4.

N. Smith beat John Cobb 6 and 5.

Doubles.—The Club beat the Aero Golfing Society 4 matches to 1.

#### SQUASH RACKETS

Air Service Training beat the Club by 4 games to 0.

Bristol and Wessex team: Morris-Keaping, Phillip, Hall,

Hayes. Air Service Training team: Veal. Collins, Webster, Wallace.

### TENNIS

Bristol and Wessex Aero Club beat Bristol Aeroplane Co. The Club team were: Cadbury, Dawnay, Boucher, Lalonde. Bristol Aeroplane Co. team: Barrett, Peckham, Marshall, Thomas. Played at Mr. Ashley Hall's residence, Chew Court, Chew Magna, near Bristol.

### LONDON AEROPLANE CLUB

A farewell party was held at the club on Saturday, September 16, when a small presentation was made to the instructors, Maj. H. G. Travers and Flt. Lt. W. F. Rimmer. The Club very much regret that Maj. Travers is not going to Hatfield with the club—he has been chief instructor for the last four years; incidentally, it was noted the other day that his flying times now total 4,000 hr. The Club are pleased to congratulate Messrs. H. E. Stonham and A. A. Wolff on passing their "A" licence tests, and W. R. Oliver on passing his night-flying test for a "B" licence. Sunday, September 17, was the last day on which flying was possible, and a good many pilots turned up to make their last flight from the old aerodrome.

### YORKSHIRE AEROPLANE CLUB (N.F.S.)

During the last week the hours flown totalled 32, which included flights to London, Stoke, Doncaster, Scarborough, Skegness, Newton House Hotel Aerodrome, and Blackpool. New members include Messrs. R. J. Foulds, J. Blayney, F. H. Webster and H. Knowles. Mr. H. Braime did his first solo this week. The total membership of the Club is 171.

### NEWCASTLE-UPON-TYNE AERO CLUB

The flying times of the Club for the year up to the present time amount to 1,083 hr., which is well up on last year. During the last week 65 hr. were flown, Messrs. J. M. Moller, D. D. Weightman, R. Dixon and D. Simon qualifying for "A" licences. Mr. E. J. Jobling-Purser has presented to the Club a trophy board which will be used for recording the winners of the London-Newcastle air race.

### MAIDSTONE AERO CLUB

Three machines are now available for tuition, cross-country and other forms of hire. The Club are holding a special motor-cycle and car gymkhana, followed by a gala dance with cabaret entertainment, on Sunday, October 1, at which all those interested in aviation will be welcome.

### DE HAVILLAND SCHOOL OF FLYING

Flying times for the past two weeks amounted to 258 hr. Soloists were Messrs. Atkinson, Ball, and Robert Douglas, of the cast of "Ten Minutes' Alibi." The London Aeroplane Club are on their way to their new aerodrome; a dance, which is being held on Saturday, September 23, will give members an opportunity of seeing their new home. The new Chief Instructor of this Club will be Mr. J. Harris, with Mr. Geoffrey de Havilland as Assistant.

### HANWORTH (N.F.S.)

Due to the change in the weather, the flying times for the week show a decrease on those of last week. On Monday, September 11, Mr. E. G. L. Russell left for a week's air trip to Oxford, Newcastle, Grimsby, and Yarmouth, with a gentleman keenly interested in fisheries as passenger. Capt. Ayre, with Mr. J. A. Harris as passenger, flew to Paris on Friday, September 15, to fetch back Miss Joan Harris. Mr. H. C. Paul left Hanworth on the same day, also bound for Paris.

### NORTHAMPTONSHIRE AERO CLUB

Important changes have lately taken place at the Club. Mr. R. L. Palmer has been transferred to Lymington and Mr. T. Rose has been appointed Manager and Chief Instructor. The plans for the new buildings have been approved and already work has been started. The general reorganisation started on Tuesday, September 12, when Capt. Davies arrived by air with Capt. Campbell, from the Air Ministry, as passenger. The Brooklands organisation is now responsible for the social as well as the flying activities of the Club. The total flying times for the week were 20 hr. 15 min.; two members started instruction, and Mrs. M. M. Shaw completed all tests for an "A" licence.

### READING AERO CLUB

The number of members in training is at present 12, and five machines are in commission. High winds and rain curtailed flying during the week, but conditions were

good enough for the "Dawn Patrol," which proved very successful. Twenty-five machines took part from Hampshire, East Anglia, Brooklands, Herts and Essex, and the R.A.F. Reserve Club. Of this number, 19 were brought down. The Airspeed "Courier" also arrived from Hanworth, but turned up before zero hour, and so was disqualified. There was an imposing array of 36 machines on the aerodrome by breakfast time. It is interesting to note that Sir Charles Rose, who won the Peters Cup at Portsmouth last week, received his early training at the Phillips and Powis School, and the machine which he was flying was originally their demonstration machine. During the week Mr. J. E. Gwynne Johns did a parachute drop from 6,000 ft., delaying pulling the rip-cord for 17 sec.

### NOTTINGHAM FLYING CLUB

The third annual competition for the Nottingham Journal Efficiency Cup was held at the Tollerton aerodrome on Sunday, September 10. The entries numbered 14 and the Cup was won by Mr. T. Bradford, of the Nottingham Flying Club, Mr. H. J. V. Ashworth being second and Mr. R. C. Winn third. The course was 170 miles—Tollerton-Skegness-Tollerton-Desford-Tollerton—the competition being more in the nature of a test of navigation than a race. On Sunday, September 17, the competition for the "Nemo" Cup was held; competitors for this cup are required to climb their machine up to a height of 1,000 ft. above the aerodrome, switch off their engine and land over a tape 5 ft. above the ground. Each competitor was allowed three attempts and the winner was the pilot who finished up nearest to the tape. The competition was open to "A" licence members of the Nottingham Flying Club. Every competitor had to be accompanied by an instructor on each flight who deducted marks for dangerous flying and other faults. The winner was Mr. Wynn, who recorded an average distance from the tape of 495 ft. Mr. H. Seely Whitby was second and Mr. E. Batchelor third.

### LANCASHIRE AERO CLUB

On Saturday, September 9, the Pemberton and Rodman landing contest was held at Woodford under very trying conditions. The Junior event was won by Mr. O. Gibson, who only started flying last June, and the Senior event by Mr. A. Collinge. Mr. R. H. Dobson, of A. V. Roe, Ltd., filled, successfully, the delicate and dangerous position of judge. The afternoon was brightened up by a garden party, and in the evening there was an informal dance in the club-house. The Australian pilots, Messrs. Ulm, Taylor, Allen and Edwards, who have been enjoying the hospitality of the Club since the unfortunate accident to their machine, left for London on Saturday, September 9, with the good wishes of all members of the Club. Among recent visitors to the Club have been Lord Amherst, John Lord, of Saunders Roe, Ltd., Sqd. Ldr. Mallet, Mr. Jack, of Scottish Midland Air Ferries, and Mr. Lindsay Everard with a party in his D.H. "Dragon." First solos have been done by Mrs. Templeton, Messrs. Watkins, Stone and Belgrave. The Club have decided to acquire another Avro "Cadet," the first having proved so popular.

### LINCOLNSHIRE AERO CLUB

The flying times for the week ending Sunday, September 17, amounted to 42 hr. 25 min., there being 14 pupils under instruction, out of whom one, Mr. E. C. Carter, did a first solo. On Sunday, September 16, the Club held their first members' rally, about 300 people being present. In the evening a dance was held in the lounge, which was well attended. The Humber Air Ferry carried 162 passengers during the week.

### CARDIFF AEROPLANE CLUB

During the last fortnight flying times have totalled 21 hr. 10 min. dual, 15 hr. 55 min. solo, and 1 hr. 45 min. tests. A new flying member is Mr. G. Owen Rees, who has recently purchased a machine, and "A" licencees are Messrs. C. Hay and A. D. Jordan.

### SOUTHEND FLYING CLUB

The Rochford aerodrome has been very quiet during the last week, many members of the Club having gone away on holiday, and the weather not having been as favourable as it might have been; during the week-end, however, there was considerable activity, and the machines have been fully engaged. Cross-country flights were done to Ipswich by Mr. D. Rankin and Mr. Sylvester, and to Hatfield, Hanworth and Croydon by Mr. Anderson. Four new pupils, including one lady, have commenced instruction. A "Fox Moth" has been purchased for air taxi work, which brings the taxi equipment up to modern standards.

# Airisms from the Four Winds

## Accidents at Brooklands

It is with the greatest regret that FLIGHT has to record the death of Lady Clayton East Clayton, which took place at Brooklands aerodrome on Friday, September 15. It appears that as she was about to take off, and when the machine was travelling across the ground, Lady Clayton climbed on to the edge of the cockpit and dropped out on to the aerodrome. If, as it seems most likely, the throttle of the machine in some way or other jammed or broke off near the hand lever, it is difficult to explain why the pilot did not resort to the obvious remedy of switching off the engine. Another accident also occurred at Brooklands on the same day, due so it seems to an error of judgment on the part of the pilot. A Vickers "Virginia," piloted by Flying Officer Leslie Maurice Few of the Special Reserve and attached to No. 500 (County of Kent) (Bomber) Squad., ran into a fence on the edge of the aerodrome and broke its back. The pilot was killed and members of the crew received minor injuries.

## From Harley Street to India

Two Harley Street specialists left Heston aerodrome on Sunday, September 17, to fly to India on an errand of mercy. The doctors were Mr. J. S. Souttar and Dr. J. H. T. Challis; they were also accompanied by a nurse, Miss M. A. Bradford. The flight is being undertaken after a wireless call from Calcutta on behalf of the wife of the Crown Prince of Nepal, who is seriously ill. The machine, a D.H. "Dragon," is being piloted by Capt. T. Neville Stack.

## Air Rally in Paris

MORE than 100 machines are expected in Paris to attend an air rally. English pilots will include Lord Hindlip, Mr. H. Gordon Selfridge, Jnr., and Mr. W. Lindsay Everard, M.P.

## Accident in Scotland

AN accident occurred at Capinoch, Dumfriesshire, on Monday, September 18, to an aeroplane which ran into a wall when landing. The Hon. John Grimston, son of the Earl of Verulam, the pilot, was uninjured, but the machine was badly damaged.

## New French Air Regulations

M. PIERRE COT, the French Air Minister, has issued an order forbidding the carrying of passengers on tours unless the pilot has acquired certain flying experience. Up to the present pilots could carry passengers after 18 hr. solo flying, which has now been increased.

## Armthorpe Aerodrome Crash

A FATAL accident occurred at Armthorpe aerodrome on Friday, September 15, resulting in the death of the pilot. Capt. G. A. Pennington was taking a D.H. "Dragon" off from Armthorpe, near Doncaster, when



ON "SHELL" SERVICE: The latest addition to the "Shell" fleet of aircraft, a Caudron "Phalene" monoplane ("Gipsy Major"), which will be used for the Shell organisation in France.

the machine ran into the edge of the aerodrome and crashed. Several of the passengers were hurt.

## Quicker Air Mails

THE Secretary of State for Air, the Marquess of Londonderry, will receive a deputation from the London Chamber of Commerce on Thursday, September 28, to discuss the subject of speeding up airways. The deputation will be led by Lord Leverhulme, President of the Chamber. Other members will be Sir Geoffrey Clarke, Chairman of the Council, the Master of Sempill, Deputy Chairman, Capt. P. D. Acland, and Mr. A. de V. Leigh.

## The Mollisons' Plans

MR. AND MRS. J. MOLLISON have definitely decided to make an attempt to beat the long-distance record this year if the weather permits. They will take off from Wasaga Beach, near Collingwood, Ontario, as soon as their machine is ready.

## Mr. Ulm Ready

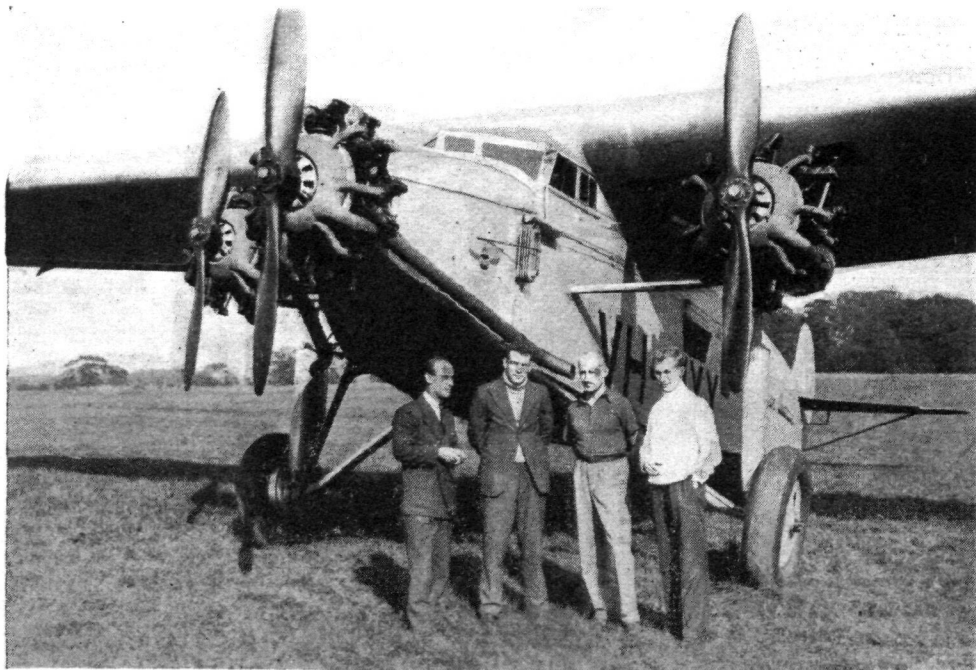
MR. C. T. M. ULM, the Australian airman, who flew to England from Australia recently, hopes shortly to fly across the Atlantic. His machine is now ready and Mr. Ulm only awaits favourable weather.

## French Air Minister's Tour

M. COT, the French Air Minister, accompanied by 11 other French air officials, arrived at Kieff on Wednesday, September 13, on the way to Moscow. On the next day the party arrived at Harkoff and were met by local civil and military authorities.

## The Graf Zeppelin

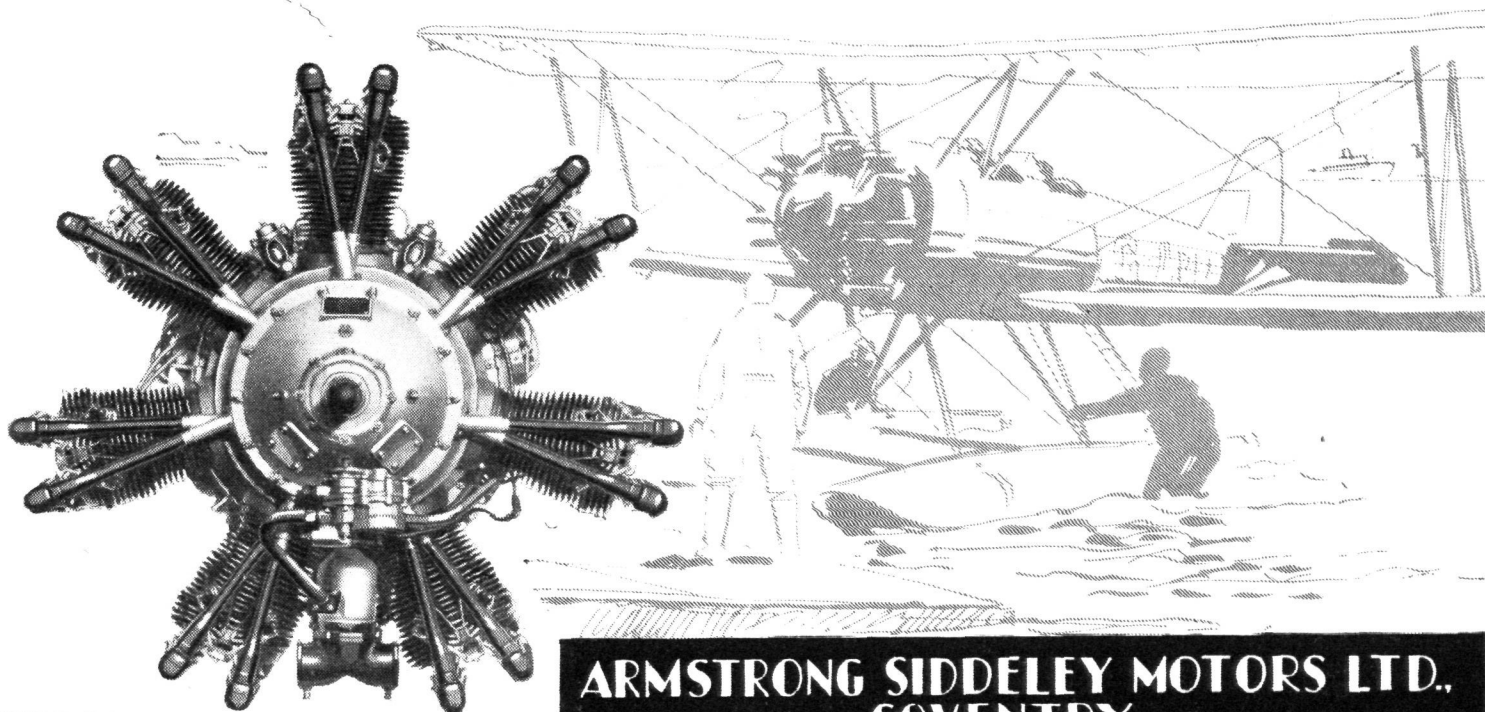
THE *Graf Zeppelin* left Friedrichshafen for Pernambuco on Saturday, September 16, at 8.15 p.m.



READY TO TRY AGAIN: Mr. C. T. Ulm is ready to make another attempt to fly the Atlantic in the Avro 10 Faith in Australia, which has now been repaired by A. V. Roe, Ltd., at their Manchester works. Our picture shows the machine and its crew—reading from left to right, Messrs. Allen, Ulm, Taylor and Edwards.



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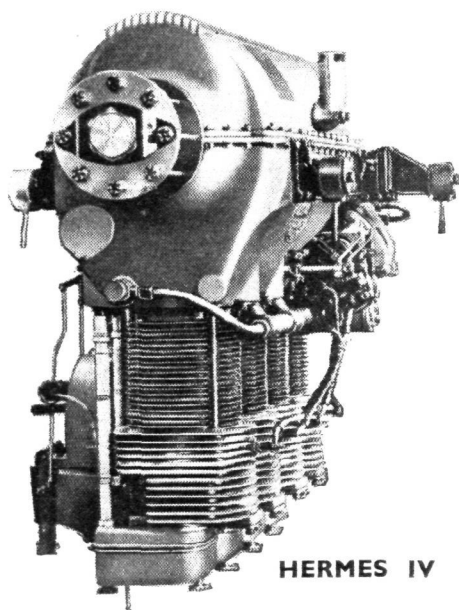
R.W.D. 5  
(Pilot : Mr. Pronasko)

### 2<sup>nd</sup> HERMES II<sub>B</sub>

R.W.D. 8  
(Pilot : Mr. Szarek)

4<sup>th</sup> and 5<sup>th</sup> positions  
gained by

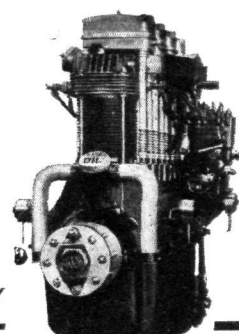
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## Croydon-Hungary Non-Stop

ANTHONY BANHIDI, whose "Gerle 13" we were able to illustrate and describe in FLIGHT for September 14, has now returned to his own country, and in doing so has made a very excellent non-stop flight, not an official record, of course, but certainly something which no one else has done. In the same aeroplane he left Croydon, at 6.10 a.m. on Friday, September 15, and arrived at Debreczen, some hundred miles west of Budapest, near the Roumanian border, at 5 p.m. This flight of 1,025 miles (1,650 km.) was accomplished with a S.S.W. wind, which helped the pilot to a certain extent, but over Austria he had the misfortune to run into bad weather; nevertheless his "Genet" engine must have done good work to get the "Gerle 13" there in only 10 hr. 50 min.

## A Celebration at Rheims

ON Sunday, September 17, an assembly of light aeroplanes was held at Rheims to celebrate what was called the 25th anniversary of the first notable cross-country flight made in Europe, or in fact in the world. This flight was made by Henry Farman from Chalons-sur-Meuse to Rheims, 27 kilometres in 20 min. He landed in a field near the Pommery House, and the great champagne firm have been much interested in the celebration. What is strange is that Farman's flight was made on October 30, 1908, so that September 17 could not strictly be called an anniversary of the event.

## "Smithy" in England

AIR COM. SIR CHARLES KINGSFORD-SMITH, who, as reported in our Croydon Notes, has arrived in this country, is proposing to return to Australia about the first week in October in a Percival "Gull." It will be remembered that we reported some weeks ago the fact that he was taking up the Australian agency for this machine. While in England, or at any rate for the present, letters should be addressed to him, c/o Henly's, Ltd., Heston Airport.

## More Landing Grounds

SIX more aerodromes have recently been added to those already listed in the A.A. Register of Landing Grounds. These are:—*Hatherley*, Gloucester; controlled by the Westgate Motor House, 211, Westgate Street, Gloucester. *Otterburn Hall*, Northumberland, which is adjacent to the Otterburn Hall Hotel, and was illustrated in FLIGHT for August 17. *Castle Douglas*, Kirkcudbright, the property of Mr. G. Rae, Mains-of-Greenlaw, Castle Douglas. *Ronaldshay*, Isle of Man, this is used for traffic to Castletown and is controlled by Mr. W. Faragher, of Ronaldshay. *Chalvey*, Slough, a private field for the use of which, however, no permit is required, belonging to Mr. A. C. M. Jackaman, Highfield, Slough. *Douglas*, Isle of Man, a one-way field close to the town, controlled by the Cunningham Holiday Camp, Douglas.

## Polish Airmen Crash

COL. FILIPOWICZ and CAPT. LEWONIEWSKI, who left Warsaw on Monday, September 11, flying eastward in an attempt to gain the long-distance record, crashed in Russia. Col. Filipowicz, who is the Director of Civil Aviation in Poland, escaped by parachute, but his companion was killed.

## An Irish-Owned Stinson

LADY CATHLEEN NELSON, of Athboy, County Meath, has just purchased a four-seater Stinson monoplane, fitted with a 215-h.p. "Lycoming" engine, which she is to fly to Ireland. Last year Lady Nelson learned to fly at Hanworth, and since that time she has put in a good many hours of solo flying. On the formation of the National Aero Club (Irish Free State) she was elected as its first President, and her new machine will be kept at the headquarters of the Club, Kildonan aerodrome, Dublin.

## A Silent Machine-Gun

A REPORT comes from Tokio that a Japanese citizen, by the name of Mr. Shimizu, of Nihombashi, has invented a silent machine-gun which works without gunpowder. Apparently the projecting force of this new gun is the centrifugal energy of a revolving disc set in motion at a great speed by a small petrol engine.

## Flying to Hungary

PILOTS flying to Hungary should note the special Travellers' Cheques instituted by the Magyar Touring Club at Budapest in conjunction with the Hungarian National Bank and the Automobile Association. A more favourable rate of exchange is now to be obtained by purchasing cheques of the face value of £4 8s. through the Automobile Association, and when tourists arrive in Hungary they obtain cash in pengös for the equivalent of £5 10s.—a free gift of £1 2s. The scheme has been made possible by utilising "frozen credits" in a way that the accumulation of foreign capital in Hungary finds an internal outlet without any detriment to national trade.

## For Flying to Mexico

THE NAVAL AIR PILOT OF CENTRAL AMERICA AND MEXICO is the official title of the American Hydrographic office publication No. 193. It is designed to furnish, in a convenient form to pilots, information of assistance in the navigation of aircraft, especially when on extended flights. The section to hand covers Mexico and is divided into two parts. The first deals with routes, distances, regulations, etc., and the second with information about the seaplane anchorages and landing fields.

Large and small scale maps are given of each anchorage or landing ground, and frequently there are aerial photographs as well. Altogether an admirable publication which should be of great value to those flying in that part of the world.



THE ANTONI VARIABLE CAMBER WING: As reported in our last issue a successful test was made at Brockworth on September 8 with a Breda fitted with this wing. Our picture shows the machine in flight.



## AIRWORTHINESS AND COMMON SENSE

By W. O. Manning, F.R.Ae.S.

*In the article published in our issue of September 7, 1933, Mr. Manning dealt with some of the effects which the increased load factors recently introduced may have on future aircraft design. In the following article he turns his attention to the subject of spinning, and makes the very telling point that an aeroplane which "flicks into a spin" but will come out of it again in the prescribed number of turns will get its C. of A., whereas a machine, which may be very difficult to spin at all, may be refused a C. of A. because if it is forced into a spin it may take a half-turn more to come out. Which is likely to be the safer machine?*

**I**N the reference to my last contribution which the Editor did me the honour to make in the editorial column, he referred, very pertinently, to the large proportion of aircraft accidents which are due to the "human element," and which are usually recorded as being due to "an error of judgment on the part of the pilot."

In this connection it is worth recalling a recent remark by Mr. C. R. Fairey, who, with his usual insight into these matters, pointed out that the aeroplane could be considered perfect when all accidents are due to the fault of the pilot.

But there is one class of accident the responsibility for which must be shared between the aeroplane and the pilot, and which might be eliminated altogether if we knew enough about aeroplane design. I refer to the common case of a stall followed by a spin.

It is quite easy to stall an aeroplane inadvertently. It has frequently happened that an inexperienced pilot has throttled down with the intention of landing on some field unknown to him, has his attention distracted by the problem of finding the best direction of approach, and allows his machine to lose flying speed. The next thing that happens is that one wing goes down and the machine goes into a spin. This is not in the least dangerous if he is at a sufficient height to enable him to recover, but if he is not, there is inevitably a bad crash. The really experienced pilot does not make this mistake; most of them have erred in this way early in their careers, have had the lesson rammed home by a narrow escape from a bad accident, and have developed their instinctive control of the aeroplane to the extent that they maintain adequate flying speed without thinking about it. The slightest suspicion of a control getting too soft and down goes the nose automatically.

But this only comes with experience which the new pilot cannot hope to possess, so we still read occasionally of accidents reported as due to the pilot's error of judgment, when what really happened was that the pilot made a simple mistake and the aeroplane did the rest.

The perfect aeroplane for the ordinary civil pilot is one which will not spin at all, and the next best is one which can only be made to go into a spin with the utmost possible reluctance, possibly by control movements which no ordinary pilot is ever likely to use.

Aeroplanes have been produced which even the most expert pilots have been unable to spin, and aeroplanes which spin only with great difficulty are not very uncommon, and it is reasonable to expect that the regulations would encourage the production of machines of this sort. Actually, there are no regulations laid down in the conditions for the issue of a certificate of airworthiness for an ordinary aeroplane which deal with this matter, though it is understood that the Test Depôt carry out tests on spinning and report if the aeroplane is considered unsatisfactory in this respect, in which case it is supposed that the issue of a C. of A. would be refused. But any such tests would seem to be carried out unofficially.

There is, however, one case in which tests are laid down, as there is a regulation that requires the new aeroplane to be tested for spinning by the applicants' pilot before being sent to the Test Depôt.

The official attitude with regard to this matter can be gathered from these regulations. In the case of the applicants' trials it is stated that the machine is to be spun for four complete turns in each direction, and that it is to recover in two turns on reversal of the controls. If it does this it is to be considered as satisfactory. There is no regulation whatever dealing with the reluctance or otherwise of the aeroplane to go into a spin. In fact, a thoroughly dangerous machine which flicks into a spin without warning passes with flying colours if it can be made to come out in the requisite number of turns, while another machine, the spinning of which might have taxed the ingenuity of the most skilled test pilot, would be refused a pass if it took half a turn too much to come out. There is no doubt that while the latter machine might be thoroughly safe in the hands of the semi-skilled pilot, the former would be most dangerous.

It is clear that these regulations are devised to insure that if an aeroplane goes into a spin, it shall be possible to get it out in a reasonable height. This is, of course, desirable, but it certainly resembles shutting the door after the horse is stolen. The unspinnable aeroplane is the target that should be aimed at, and extreme reluctance to go into a spin should be accepted, in lieu of the regulation recovery. The aeroplane which spins is only safe in this respect if it can be got out and is at a sufficient height for recovery. Aeroplanes which either do not spin or spin with extreme reluctance are safe at any height.

There is another regulation which lays down the length of run which the aeroplane must not exceed in leaving the ground, and another which states that it must attain a certain height from the ground in a certain distance. These regulations are clearly designed to ensure that the machine should be able to get away comfortably from an ordinary aerodrome, and, as such, are desirable, but it is not easy to see why a further regulation should be added requiring that a machine should reach a height of 1,180 ft. in less than three minutes.

The ideal type of aircraft for leaving any aerodrome would presumably be one which was capable of going straight up, as a possible helicopter might be able to do, but whether or not it would reach the specified height in the specified time would have no meaning in connection with its safety. The same thing is true of the ordinary aeroplane, and the regulation has the unfortunate effect of hampering the development of cheap low-powered aircraft, which might do much to popularise flying, as in such machines the minimum power requirement is conditioned by this regulation. The important thing in this connection is angle of climb not rate of climb.

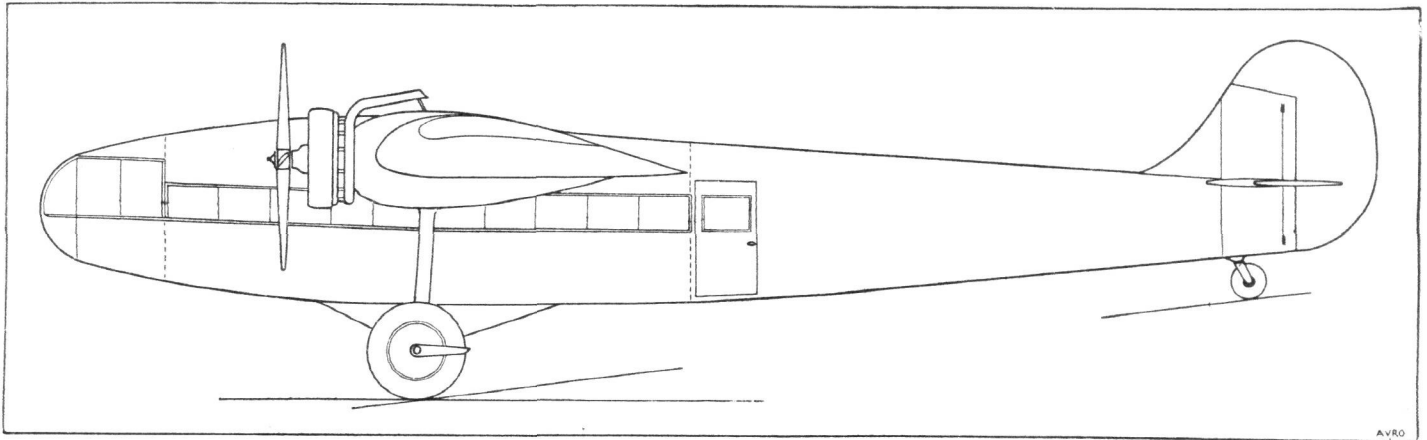
There is, curiously enough, one matter in which the motor car is subject to regulation and the aeroplane is not. I refer to exhaust noise. In order to forestall an excuse for further regulations, it is most desirable to fit all civil aircraft with silencers. The complaints, very often justified, by those residing near aerodromes of disturbance from this cause will rise to a howl of indignation as aeroplanes become more numerous, and the result may be that regulations will be made specifying the number of decibels of sound that a machine will be permitted to emit, and a further trouble added to those already borne by our long-suffering designers.

### Rear Admiral Commanding Aircraft Carriers

REAR ADMIRAL THE HON. SIR ALEXANDER RAMSAY became Rear Admiral Commanding Aircraft Carriers on

September 15 in succession to Rear Admiral Henderson. C.B. Sir Alexander Ramsay is the husband of Lady Patricia, second daughter of the Duke of Connaught.

# Air Transport



Side elevation of the new Avro Commercial monoplane.

## TWO NEW COMMERCIAL AEROPLANES

### THE AVRO MONOPLANE

**T**HE following brief notes regarding a new commercial aeroplane being produced by A. V. Roe & Co., Ltd., may be of interest.

The first machine in this new series of Avro commercial types is a somewhat larger aeroplane than the Avro Ten and is fitted with two geared "Jaguar" engines. Instead of making the top longerons of the fuselage continuous and attaching the wing directly thereto, A. V. Roe & Co. have adopted a modification, which was tried out very successfully in the Avro Six. At the point of attachment of the wing, the top longeron is dropped, so that the top line of the fuselage is continued in the upper surface of the wing instead of in the lower surface of the wing as before. This means that the spars pass right through the upper part of the cabin. The result of this alteration is to allow a reduction in the head resistance of the machine, while actually affording more head room for the passengers, the position of the spars in the cabin creating merely a momentary break in the general lofty appearance of the cabin.

In the present machine the two members of the crew will occupy a control room situated in the extreme nose of the fuselage and the flying controls will be very similar to those of the Avro Ten. Immediately behind this

control room is the passengers' cabin, which is arranged on the machine at present building to accommodate sixteen passengers, with limited fuel range. It is probable that for normal commercial transport purposes the number of passengers will be reduced and the fuel range increased. The entrance door, lavatory accommodation and a rear baggage hold are all similar to the corresponding provisions made on the Avro Ten. The undercarriage, however, will be of the new Avro oleo type, in which rubber is not used at all. Either a tail wheel or a tail skid can be fitted, according to choice.

The engine mountings are attached directly to the front spar of the wing and are suitably streamlined into the aerofoil section by means of cowling and fairings. Each engine has a separate oil tank, mounted in the leading edge of the wing, and a separate fuel tank of welded aluminium, carried in a cradle between the front and rear spars of the wing.

No performance figures are yet available, but a very much better performance than that of the Avro Ten is expected.

### A NEW SHORT TRANSPORT MONOPLANE

**T**HIS twin-engined machine has been designed as a low-powered transport aeroplane suitable for small aircraft operators and for special charter work. It is a high-wing full-cantilever monoplane powered with two Pobjoy engines mounted under the main plane. The pilot is situated in the nose of the fuselage in a covered-in cockpit from which position he has an excel-



The new Short Transport monoplane making a test flight.

lent view for take-off and landing. The cabin is arranged to accommodate five passengers with ample seating space for each passenger.

The aircraft is of very sturdy construction, the fuselage being built of welded-steel tubes and the wing spars of a built-up framed structure giving extreme stiffness and torsional rigidity. All control surfaces are balanced, being very light in operation and well harmonised.

Preliminary flight tests have been carried out, the results of which have been extremely satisfactory. With an all-up weight of 2,700 lb., the aircraft takes-off in 10 sec., and

has an initial rate of climb of 700 ft. per min. The landing speed is approximately 45 m.p.h., and the machine cruises at 93 m.p.h., throttled to 90 per cent. of normal engine revolutions.

Tankage is provided for a range of 350 miles at cruising speed. The aircraft has strength factors for an all-up weight of 3,000 lb., which will give a pay load plus crew of over 1,000 lb.

After the completion of the exhaustive tests now in hand, further machines will be put in hand which will be ready for delivery in the spring of 1934.

#### A WORLD'S AIRSHIP SERVICE

**T**HE Dutch paper "De Maasbode," in its issue of September 10, published some interesting information concerning future airship development in an interview with Mr. H. E. Ruytenschildt, of the Stoomvaart Maatschappij Nederland.

The visit of Dr. Hugo Eckener, director of the Luftschiffbau Zeppelin, and Mr. A. F. Bronsing, director of the Stoomvaart Maatschappij Nederland, to North America is an important one. These two gentlemen will not only discuss with interested American business men questions concerning the aeronautical plans of these two shipping companies, but will discuss the all important question of the establishment of an American-German-Dutch combination to exploit a world service of Zeppelins. Plans have been in existence for some time but the "Akron" disaster impeded further progress somewhat. If the projected plans are carried out an airship service will be established between New York and Barcelona without any intermediate stopping place, and a service to Batavia.

One of the questions which will arise is whether helium gas should be used. Dr. Eckener is of the opinion that the dangers of hydrogen are over-estimated, but the Dutch syndicate think that only with the use of helium can a sufficient standard of safety be reached; they are also in favour of crude oil engines being used, thus reducing the danger of fire caused by the presence of petrol. Mr. Ruytenschildt said that the building of a Dutch airship would depend on the coming discussions in America, but in any case they must await the launching of the L.Z.129 now in construction at Friedrichshafen, which could not be before August, 1934. The Dutch syndicate are still considering the possibilities of an airship service to the Dutch East Indies, but matters involved are too great for undue precipitation. The representative of the Dutch syndicate Mr. J. E. van Tyen still takes part in all flights of the "Graf Zeppelin" as a member of its crew, while from mid-September onwards a Dutch naval engineer, Mr. H. G. Hoffmann, will be detached to study the construction of airships.

#### I.A.T.A. in England

As recorded elsewhere in this issue (p. 929) the 13th Session of the International Air Traffic Association is being held at Lincoln's Inn.

The following is a list of the delegates attending this session of I.A.T.A.:—

*Chairman*, Mr. G. H. Woods Humphery; *Vice-Chairman*, Dr. A. Ehinger; *Members*, Jonkheer I.L. van den Berch van Heemstede, General Manager; Dr. D. Goedhuis, Office Chief; *Technical Committee*, Commandant A. Faure, Chairman.

##### COMPANIES

*A.B. Aerotransport* (Sweden): Capt. Carl Florman, Manager; Mr. P. A. Norlin, Assistant Manager; Mr. Hugo Krafft.  
*Aero Espresso Italiana* (Italy): Le Gr. Off. N. Giansana, President; Le Dr. Ing. L. Acampora, Directeur.  
*Aero O/Y* (Finland): M. C. J. Ehrnrooth, President; M. G. A. Stahle, Directeur General; M. G. Gronblum, Directeur.  
*Air France* (France): M. Allegre, Administrateur Directeur General; M. Briend, Secrétaire General.  
*Avio Linee Italiane* (Italy):  
*Ceskoslovenska Letecká Společnost* (Czecho-Slovakia): M. Bohuslav Stulik, Directeur Commercial.  
*C-S-A Ceskoslovenska Statni Aerolinie* (Czecho-Slovakia): M. F. Stoces, Directeur.  
*Det Danske Luftfartselskab* (Denmark): M. K. Krebs, Directeur.  
*Deruluft* (Deutsche-Russische Luftverkehrs-Gesellschaft): M. P. Fette, Directeur; M. W. Steinhardt, Directeur.

*Deutsche Luft Hansa* (Germany): Major M. Wronsky, Director; Dr. Döring.

*Imperial Airways* (Gt. Britain): Mr. G. E. Woods Humphery, Managing Director; Mr. D. H. Handover, Traffic Manager; Major K. M. Beaumont, Legal Adviser.

*K.L.M. (Koninklijke Luchvaart Maatschappij Voor Nederland en Kolonien)* (Holland): Mr. A. Plesman, General Manager; Mr. D. J. de Vries, Foreign Manager.

*L.A.P.E. (Lineas Aereas Postales Espanolas)* (Spain): M. Vicente Roa, Presidente.

*Navigazione Aerea* (Italy): M. l'Ing. Guido Sacerdote.

*Norske Luftrederi* (Norway): M. W. Meisterlin, Delegee.

*Osterreichische Luftverkehrs. A.G.* (Austria): M. Le General F. Deutelmoser, Conseiller d'Administration.

*Polskie Linie Lotnicze (L.O.T.)* (Poland): M. l'Ing. Wacław Makowski, Directeur General; M. l'Ing. Louis Zeffert, Vice-Directeur.

*S.A.B.E.N.A. (S.A. Belge d'Exploitation de la Navigation Aérienne)* (Belgium): M. Perier, Secrétaire General.

*Societa Aerea Mediterranea* (Italy): On le Domenico Giuriata, Conseiller juridique; Le Dr. Ing. Enrico Venturini.

*Societa Italiana Servizi Aerei (S.I.S.A.)* (Italy): l'Ing. Cav. Antonio Majorana, Directeur General.

*Swissair (S.A. Suisse Pour la Navigation Aérienne)* (Switzerland): Dr. A. Ehinger, President.

##### INTERNATIONAL ORGANISATIONS

*Comite Juridique International de L'Aviation*: Mr. Edward S. M. Perowne.  
*Comite International Technique d'Experts Juridiques Aeriennes (Citsja)*: M. E. Sudre, Secrétaire General.

*International Chamber of Commerce*: M. Pierre Comoz, Aeronautical Expert.

*C.I.N.A. (Commission International de Navigation Aérienne)*: Mr. Alber Roper, General Secretary.



**AWAY UP NORTH:** The D.H. "Dragon," operated by Highland Airways on their Inverness-Orkney service, at Wideford Airport.



# MARCONI

## WIRELESS EQUIPMENT FOR AIRCRAFT AND AERODROMES

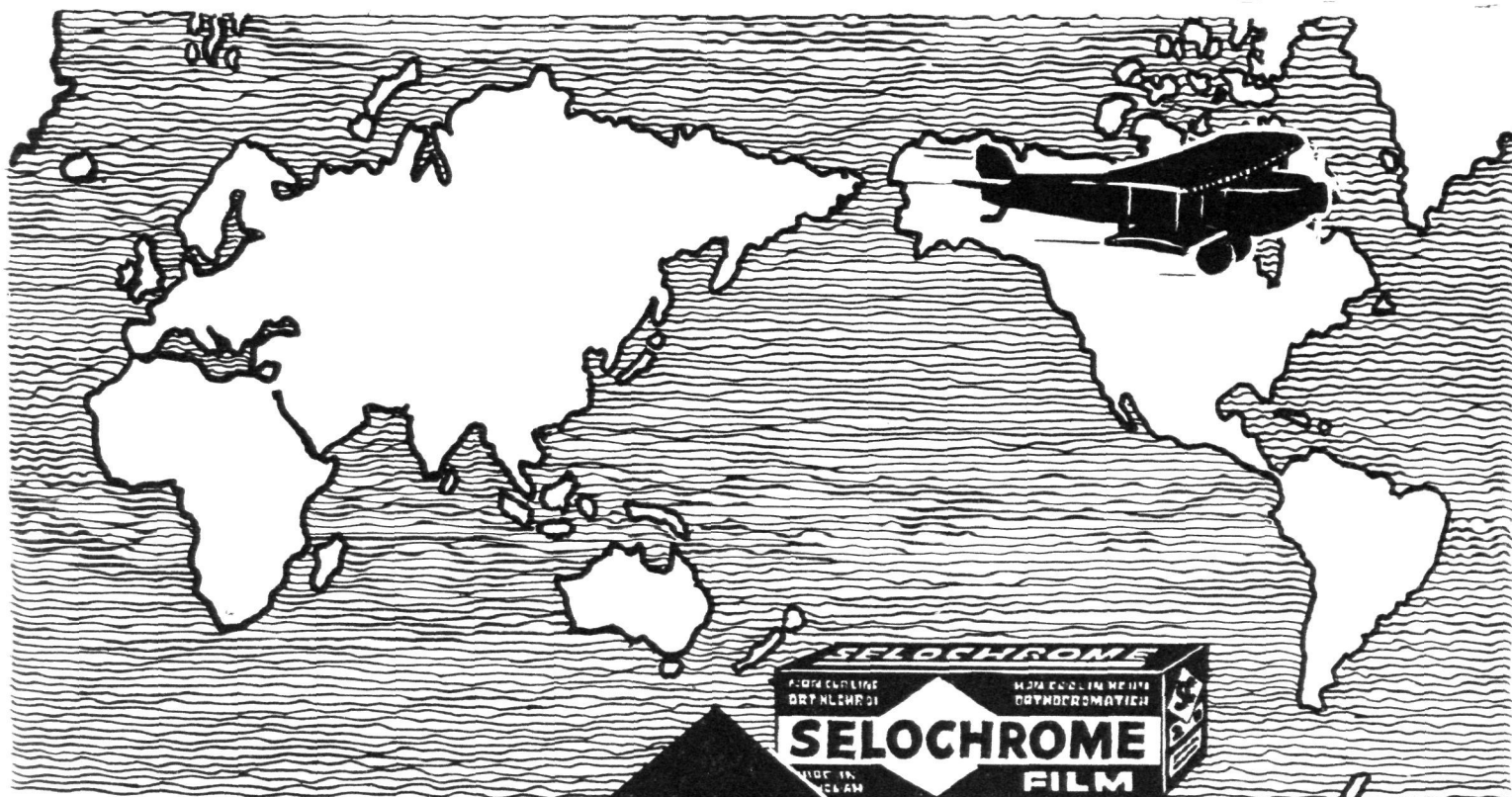
● The Marconi Company's experience in the design and installation of wireless equipment for all classes of aircraft and aerodromes is unrivalled throughout the world. 1750 aircraft in more than 30 countries carry Marconi equipment. The new Marconi combined medium and short wave equipment provides the only practical means of establishing reliable wireless communication on tropical air routes. It is fitted in the entire new fleet of "Atlanta" aircraft of Imperial Airways Limited, and has proved emphatically successful on the African air route, with record two-way communication ranges between air and ground up to 5,000 miles. Marconi direction finding facilities include directional receivers for air or ground operation; the Marconi-Adcock "anti-night-effect" aerodrome direction finder; the Marconi "homing" device; and the Marconi visual type course indicator.

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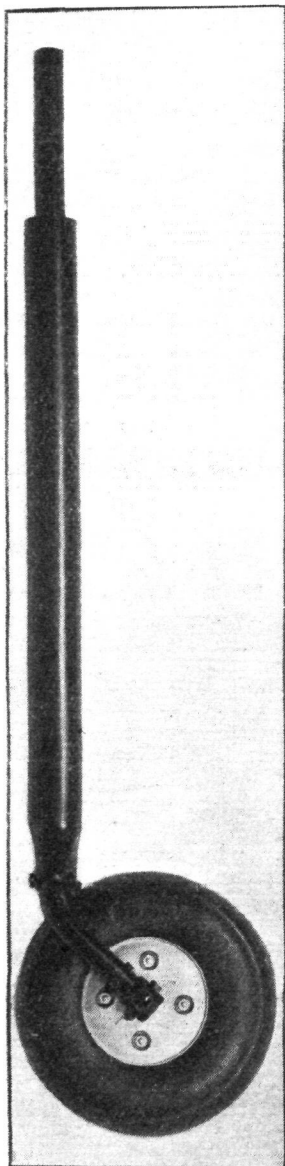
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# Airport News

## CROYDON

**A**N event of some importance last week was the arrival by K.L.M. of Sir Charles Kingsford Smith. He had previously flown from Batavia to Amsterdam by that company's Eastern line. He was met by Mr. Percival, who flew him away to Heston immediately. Sir Charles, it is understood, will remain in this country a few weeks only, and then fly back to Australia in a Percival "Gull" which is being got ready for the job.

It seems that one thing leads to another as soon as Croydon Aerodrome dogs are mentioned. It is now pointed out to me that "Jip," the inevitable companion of "Timber" Woods of Surrey Flying Services, has more than a slender claim to fame. Not only is "Jip" able to open the "roundabout" doors of the Aerodrome Hotel, but he has developed an "air" instinct which is positively uncanny. When his master is away on a flight he turns up to welcome him, not at the time when the Control Tower decides he is due to land, but at the actual time of his arrival. Nobody knows how "Jip" works the matter out, but he has been known to sense the time of arrival of his master with astonishing accuracy time after time.

On Friday evening, by Deutsche Luft Hansa, Dr. Sack, the eminent German lawyer, arrived and had some delay in passing the emigration authorities. It is scarcely fair to blame the authorities at the Airport of London for such delays. They have their duty to perform, and, whenever possible, they do all in their power to expedite the passage of air travellers through the necessary formalities. Dr. Sack came here to be present at the unofficial "trial" being held in London in the matter of the Reichstag fire, and will actually defend Torgler in Berlin.

Considerable interest was displayed in the K.L.M. Fokker

"F.12," which visited Croydon several times during the past week. It has three Hamilton Steel Company's variable pitch propellers which, according to the pilots, greatly increase the climb of the machine and add about 15 m.p.h. to its speed.

An Airspeed "Courier," with retractable undercarriage, was brought to the airport on Saturday last by Mr. Naish, and was demonstrated. Incidentally, a neighbouring householder rang up to say that a machine which had lost its undercarriage had passed over his house.

Air-France sent two aeroplanes, a "Golden Clipper" and a Breguet to the 25th anniversary of the first flying meeting at Rheims. On board were a number of London newspaper men and business men interested in the champagne trade. It is understood that the hospitality of the Rheims City Fathers was magnificent.

During the week the Marquess of Donegal travelled from Rheims, via Paris, by Air France to Croydon, and other important names on various passenger lists were Lord and Lady Inchcape, Prince Eugene de Ligne, Lord Tyrrell, Gen. Critchley and Harold Huth, the actor. The variety of well-known travellers by air during any week is some criterion of the ever-growing popularity of the air as a medium of travel.

On Wednesday, Mr. Dellaert, who corresponds to the Chief Aerodrome Officer at Croydon, but whose actual title is Airport Harbour Master of the Airport of Amsterdam, Schipol, visited Croydon in the company of Mr. Thomson, K.L.M. Aerodrome Manager and Chief of the Flying Services, Amsterdam. Mr. Dellaert was received and entertained by Maj. F. L. Richard, Chief Aerodrome Officer at Croydon, and made a very thorough inspection of the airport, with special regard to night-flying lights and facilities.

A. VIATOR.

### Air Transport Co.

THIS company are taking over the flying rights of the Maidstone Flying School, and are supplying three machines and a pilot, Mr. Peacock. The company has no financial interest in Maidstone aerodrome other than leasing the flying rights, joyriding, taxi work, and repairs, from the present occupiers. The company hope to be at Maidstone in a week's time and to have the school open by October 1.

### "Contact"

BRITISH INSTRUCTIONAL FILMS have co-operated with Imperial Airways to produce an impression of how our airways spread across the Empire, and of the beautiful sights which await the air traveller. Impression is the right word to use, for the film as shown is impressionistic in the extreme. It is more; it is almost cubistic. At least that is the effect produced on the audience by the rapidly appearing and disappearing glimpses of making piles and piles of valves and cylinders and other components of aircraft and engines. Doubtless the producer was right not to dwell too long on the constructional side. He has succeeded in conveying an idea of something wonderful being done, something not to be understood by the people, and probably his judgment was right in aiming at that effect. But when the aeroplanes and engines had been assembled and began to fly, he would have been wiser to have left the jerky, scrappy style behind him and given his audience something more coherent. For instance, when *Hengist* started to taxi off the tarmac at Croydon we got about four different shots of him as he turned. This left us almost giddy, and we sighed with relief when he got into the air. There is a lot of beautiful photography, but the almost frenzied desire not to make the film too long, and to keep giving scraps, scraps, scraps, deprived the audience of much enjoyment. There was not very much sound, and what there was, was successfully drowned by the orchestra. We make no grievance of that. The ideas of film producers are sometimes strange. All the material for an excellent film is here, but the result, as shown at the Regal Cinema, Marble Arch, is unsatisfying.

### National Aviation Corporation

NATIONAL AVIATION CORPORATION, by selling 162,511 shares of stock in North American Aviation to General Motors, has increased its assets as from June 30, 1933, to 5,481,027 dollars (£1,191,527) as compared with 3,991,777 dollars (£867,778) at the end of 1932. The company showed a net loss for the six months of 479,253 dollars (£104,186) which includes losses on sales of securities amounting to 448,826 dollars (£97,571). The company has increased its holdings in Pan American Airways from 48,000 to 65,447 shares.

### New R.A.F. Station

A NEW R.A.F. station is to be set up at Manby, five miles from Louth, in Lincolnshire, which is to serve as the headquarters of the R.A.F. in the eastern district.

### R.Ae.S., Bristol Branch

THE following programme of meetings has been arranged for the 1933-34 Session of the Bristol Branch of the Royal Aeronautical Society, of which Capt. F. S. Barnwell is Chairman. Members will be notified as to the time and place of the meetings.

October 3, 1933.—"The Spinning of Aeroplanes," by A. V. Stephens of B.A. Department, R.A.E.

October 24, 1933.—"Some Notes and Observations on Petrol and Diesel Engines," by H. R. Ricardo, B.A., F.R.S., A.M.I.C.E.

November 7, 1933.—"The Long-Range Flight," by Sqd.-Ldr. O. R. Gayford, D.F.C., A.F.C., R.A.F.

November 21, 1933.—"The Empire's Airway," by G. O. Waters, Station-Superintendent at Croydon Aerodrome.

December 5, 1933.—"Interference," by E. Ower, B.Sc., A.C.G.I.

December 12, 1933.—"Air Flow" (postponed from last session), by W. S. Farren, M.B.E., M.A.

January 2, 1934.—"Testing of Aero Engines," by G. O. Anderson, A.M.I.Ae.E.

January 23, 1934.—"Meteorology," by Capt. F. Entwistle, B.Sc.

February 13, 1934.—"New Methods of Testing by Impact," by Prof. R. V. Southwell, M.A., F.R.S.

February 27, 1934.—"Record-Breaking Engines," by R. N. Dorey, B.Sc., of Rolls-Royce.

March 13, 1934.—Annual General Meeting.



# COAST DEFENCE EXERCISES

## Royal Navy and Royal Air Force on the Forth

ON Friday and Saturday next, September 22 and 23, weather permitting, a novel and extremely interesting exercise will be carried out by the Royal Navy and the Royal Air Force in conjunction off the Firth of Forth. The exercise will take the form of an attack by a fleet of three capital ships, two aircraft carriers, two cruisers and 15 destroyers, led by the cruiser H.M.S. *Cairo*, on the little town of Elie, in Fife, on the northern shore of the firth. The only defences available will be nine squadrons of the Royal Air Force, and the idea is to practise the Navy in attacking and the Air Force in defending in such unusual circumstances. Because we call the circumstances unusual, that is not to say that such a situation will not arise in a future war, and it is thought desirable that both Services should have experience of what is likely to be wanted. As this is the first exercise of the sort ever undertaken, it has been thought wise to make it as simple as possible, and this implies giving an air of unreality to it in certain respects. This unreality will not in any way diminish its usefulness as a training exercise. It is not to be regarded as a sham war in which one side or the other will win. For the Fleet it will provide practice in long-distance oversea reconnaissance by aircraft from the ships, and also in long-distance attacks by the same aircraft on a shore base, as well as defence of the ships against attacks by the enemy's aircraft. It will also provide excellent practice for the aircraft lookouts in the ships, and to the anti-aircraft crews in drill at their guns. In fact, all the ships' companies will get practice in a realistic war exercise.

For some of the units of the Air Force the experience will be even more novel, and therefore presumably more valuable. Apart from two squadrons of flying-boats, whose crews may be taken as familiar with matters nautical, and one squadron of torpedo-bombers which really belongs to the Fleet Air Arm but has been lent to the defence, the squadrons engaged belong to the Wessex Bombing Area and the Auxiliary Air Force, and they have never been trained in work overseas, and may be presumed to be quite ignorant of all which concerns a fleet. At the end of the two days they will probably have corrected a good deal of this ignorance. The flying-boats will have good practice in long-distance reconnaissance, for they will have to search large stretches of sea in the endeavour to spot the units of the fleet, and when they have spotted any to recognise what they are. It is unfortunate that No. 100 (Bomber) Squadron is not available for the exercise, as they are equipped with torpedo-carrying "Vildebeestes," and this exercise would have been of particular value to them. Their place is being taken by No. 811 (Torpedo-Bomber) Squadron from the Fleet Air Arm.

The forces on both sides will be as follows:—

### Red (attacking) Force (Rear Admiral W. M. James, C.B.).

#### Capital Ships.

H.M.S. *Renown*, carrying one Fairey 3F. seaplane.  
H.M.S. *Warspite*.  
H.M.S. *Malaya*.

#### Cruisers.

H.M.S. *Leander*, carrying one "Osprey" seaplane.  
H.M.S. *York*, carrying one "Osprey" seaplane.  
H.M.S. *Cairo*.

#### Carriers.

H.M.S. *Courageous*, carrying No. 800 (Fleet Fighter) Squadron, nine "Nimrods" and three "Ospreys"; No. 810 (Torpedo-Bomber) Squadron, six "Darts" and six "Ripons"; No. 821 (Fleet Spotter Reconnaissance) Squadron, nine "Seals."

H.M.S. *Furious*, carrying No. 801 (Fleet Fighter) Squadron, six "Nimrods"; No. 822 (F.S.R.) Squadron, 12 "3F.s."

#### 15 Destroyers.

In addition six destroyers will be neutral and will act as lifeboats in case of a forced landing by an aircraft.

### Blue (defending) Force (Air Marshal R. H. Clark-Hall, C.M.G., D.S.O.)

No. 201 (Flying Boat) Squadron from Calshot, five "Southamptons."

No. 210 (F.B.) Squadron from Pembroke Dock, four "Southamptons."

No. 12 (Bomber) Squadron from Andover, nine "Harts."

No. 33 (B.) Squadron from Bicester, nine "Harts."

No. 40 (B.) Squadron from Abingdon, nine "Gordons."

No. 101 (B.) Squadron from Andover, 10 "Sistranders."

No. 602 (B.) Squadron from Abbotsinch, 12 "Wapitis."

No. 603 (B.) Squadron from Turnhouse, 12 "Wapitis."

No. 811 (T.B.) Squadron from H.M.S. *Furious*, 12 "Ripons."

The Auxiliary A.F. squadrons from Glasgow and Edinburgh will probably not be at full strength.

The total possible number of aircraft engaged will be:—Red 54 and Blue 91. Total 145.

It has been decided not to supply the Blue force with any fighters, but when necessary some bombers may be used as protective aircraft.

The operations are being divided into two phases. The first begins at noon on Friday, the 22nd. The two squadrons of flying boats will then take off and will try to locate the enemy ships. The area which has to be searched that afternoon is about 600 square sea miles. The Blue bombers may not set out that afternoon to attack the Red fleet, which is presumed to be outside their range. The Red aircraft from the Fleet may, however, make attacks on the town of Elie, and the Blue bombers may go up for the local defence of the town. The authorities are not such bad mathematicians as to imagine that the Blue aircraft could not reach the Fleet if the Red aircraft can reach the shore, but for the sake of the practice it has been decided to pretend that the Fleet is actually out of range from the shore.

The second phase will begin at dawn on Saturday, the 23rd. Again, the flying boats will search for the Red Fleet. On this day the only navigable water is assumed to be in a different sector from May Island. The area to be searched will be nearly 1,000 square sea miles. On this day all the forces of the defending side may be used to attack the enemy. The Blue squadron of torpedo-bombers will make one attack with torpedoes (with dummy noses), if the sea is such that recovery of the torpedoes is possible. Their other attacks will be "light."

No bombs will be dropped. The bombers will fire red Very lights to show that they would have dropped bombs. No actual fighting attacks will be allowed; in fact, hostile aircraft must not approach within 100 yards of each other, but a green Very light will be fired to show that an air attack on other aircraft would be made.

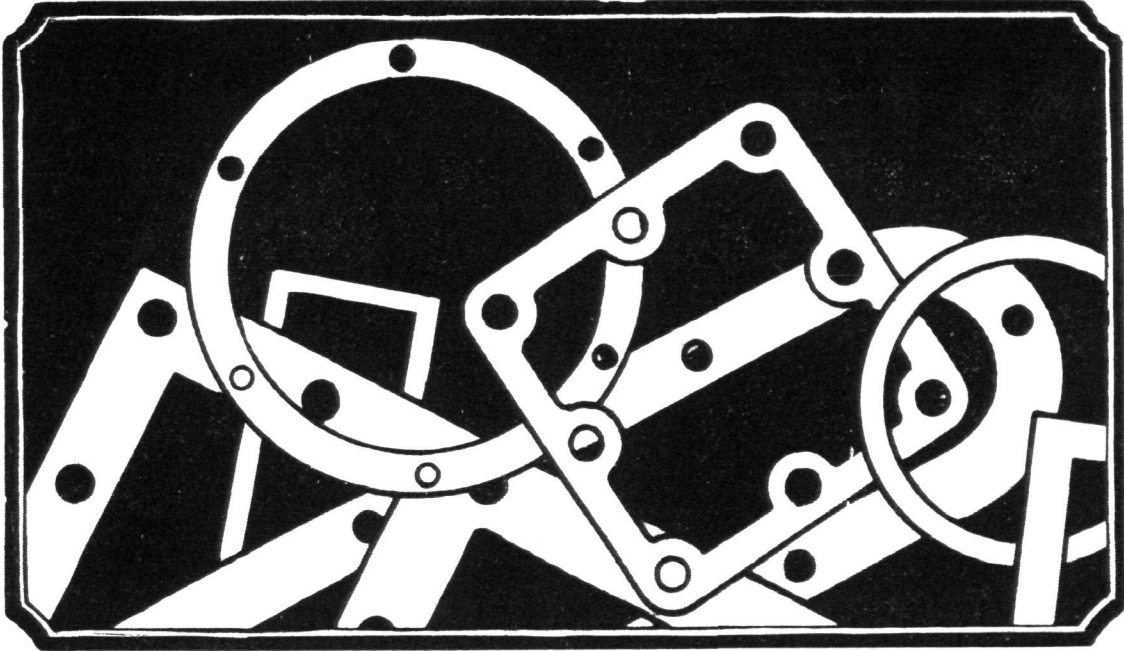
Most of the bombers have been fitted with a form of flotation gear in case they should be forced to alight on the sea, but two of the squadrons are not so equipped. The six neutral destroyers will be ready to hurry to the rescue if that should happen. These will fly a large blue flag at the masthead, and when spotted by a flying boat will signal "N" with a searchlight. Should the weather not be favourable on the Friday, phase I will be cancelled, and the second phase will begin on the Saturday. Should both days be unsuitable, the exercise will be postponed until Monday, the 25th, and Tuesday, the 26th.



## National Charity Air Pageant

THE programme at the National Charity Air Pageant will include an attack on the land speed record, at present held by Maj. Doolittle, who has attained a speed of 294.36 m.p.h. Many well-known pilots have been invited to attend, including Maj. Doolittle himself, Col. Roscoe Turner, Capt. James Haizlip, Lee Gehlbach and James

Wedell, the "Wasp"-powered "Gee-Bee" and the Wedell-Williams racers will probably be used. There will also be an Aerial Treasure Hunt over a course from St. Louis to New York, and an international relay race between teams from flying clubs in the United States and Canada. The Pageant will be held at Roosevelt Field, New York, on October 7 and 8.



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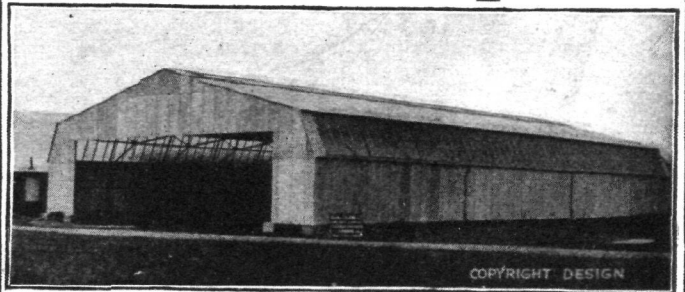
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# THE ROYAL AIR FORCE

London Gazette, Sept. 12, 1933.

## General Duties Branch

The following are granted short service commissions as Pilot Officers for five years on the active list with effect from and with seniority of August 15 :—H. B. Hurley, V. W. Glasheen, K. D. Salmon, L. V. Spencer, N. G. Mulholland, A. C. Mills.

Cdr. E. M. C. Abel-Smith, R.N., is re-attached to the R.A.F. as a Squadron Leader with effect from August 17, and with seniority of January 1, 1933.

The following Acting Pilot Officers on probation are confirmed in rank and graded as Pilot Officers (August 12) :—H. G. L. Ankop, C. F. S. Fraser, F. W. Hilton, D. R. Keiller, G. J. Spence, N. W. Wakelin, R. H. Young.

Acting Pilot Officer on probation H. S. Miles is graded as a Pilot Officer on probation (August 12).

The following Pilot Officers are promoted to the rank of Flying Officer (August 28) :—E. V. Knowles, J. R. Talbot.

Wing Commander H. W. G. J. Penderel, M.C., A.F.C., is restored to full pay from half pay (September 1).

Squadron Leader J. F. Gordon, D.F.C., is restored to full pay from half pay (August 31).

Flight Lieutenant L. G. Nixon is placed on the half-pay list, Scale A, from September 10 to September 14 inclusive.

Flight Lieutenant J. C. M. Hay is placed on the retired list (September 12).

Flight Lieutenant H. W. Raeburn is transferred to the Reserve, Class A (September 1).

Sub-Lt. A. W. Goldsmith, R.N., Flying Officer, R.A.F., relinquishes his temporary commission on return to Naval Duty (August 31).

## Accountant Branch

Flight Lieutenant F. C. Langley is placed on the retired list at his own request (July 27). (Substituted for the notification in the *Gazette* of August 8.)

## Medical Branch

Flight Lieutenant L. P. McCullagh, M.B., B.Ch., is promoted to the rank of Squadron Leader (September 7).

## Memorandum

The permission granted to G. C. De Roy to retain the honorary rank of 2nd Lt., which was withdrawn on his enlistment in the Royal Corps of Signals, is restored on his discharge (November 5, 1921).

## PRINCESS MARY'S ROYAL AIR FORCE NURSING SERVICE

Sister Miss D. M. Roberts resigns her appt. (September 11).

## ROYAL AIR FORCE RESERVE RESERVE OF AIR FORCE OFFICERS

### General Duties Branch

Flying Officer C. A. S. Parker (A.A.F.) is granted a commission in Class C as a Flying Officer (September 16, 1930). (Substituted for the notification in the *Gazette* of November 24, 1931.)

The following Flying Officers are transferred from Class A to Class C :—R. G. Mullette and B. R. Rolfe (September 12).

Pilot Officer R. W. Aitken is transferred from Class AA (ii) to Class C (August 17).

Pilot Officer D. Beevers is transferred from Class C to Class AA (ii) (August 31).

The following Flying Officers relinquish their commissions on completion of service :—E. L. Leader (July 5), D. R. Gray (July 10), N. F. Marsh (July 16), and S. M. Thompson (July 23).

Pilot Officer J. L. Browne relinquishes his commission on completion of service (July 2).

Flying Officer W. Ledlie relinquishes his commission on completion of service and is permitted to retain the rank of Flight Lieutenant (August 4).

Flying Officer H. C. Norman relinquishes his commission on completion of service and is permitted to retain his rank (September 2).

Flying Officer B. Hackforth resigns his commission and is permitted to retain his rank (August 23).

## SPECIAL RESERVE

### General Duties Branch

The following Pilot Officers on probation are confirmed in rank :—H. Baker (August 1), J. R. T. Bradford (August 5), J. H. Becher (August 7).

## AUXILIARY AIR FORCE

### General Duties Branch

No. 601 (COUNTY OF LONDON) (BOMBER) SQUADRON.—Pilot Officer R. A. Farquhar is transferred to No. 605 (County of Warwick) (Bomber) Squadron (July 17).

No. 602 (CITY OF GLASGOW) (BOMBER) SQUADRON.—Pilot Officer C. A. S. Parker is promoted to the rank of Flying Officer (January 6, 1930).

Flying Officer C. A. S. Parker resigns his commission on appointment to a commission in the Reserve of Air Force Officers (September 16, 1930). (Substituted for the notification in the *Gazette* of November 24, 1931.)

## ROYAL AIR FORCE INTELLIGENCE

**Appointments.**—The following appointments in the Royal Air Force are notified :—

### General Duties Branch

**Squadron Leaders :** H. D. O'Neill, A.F.C., to Air Ministry, Dept. of Chief of the Air Staff (D.O.I.), 6.9.33. For Air Staff duties *vice* Sqd. Ldr. R. W. Chappell, M.C.

**Flight Lieutenants :** R. C. Wansbrough to Air Ministry, Dept. of A.M.S.R., 5.9.33. N. A. P. Pritchett to R.A.F. Base, Gosport, 4.9.33.

**Flying Officers :** I. A. Critchley to Electrical and Wireless School, Cranwell, 23.8.33. L. E. Dalrymple to No. 57 (B) Sqdn., Upper Heyford, 24.8.33. M. V. Delap to Marine Aircraft Experimental Establishment, Felixstowe, 5.9.33. R. L. Mills to No. 811 (F.T.B.) Sqdn., 1.9.33. O. A. Morris to No. 207 (B) Sqdn., Bircham Newton, 5.9.33. F. A. A. H. Strath to No. 39 (B) Sqdn., Risalpur, 15.8.33. R. M. Smith to No. 45 (B) Sqdn., Helwan, 22.8.33.

**Pilot Officers :** J. G. Bigelow to No. 29 (F) Sqdn., North Weald, 29.8.33. G. D. M. Blackwood to No. 25 (F) Sqdn., Hawkinge, 26.8.33. N. D. Crockett to No. 57 (B) Sqdn., Upper Heyford, 21.8.33. H. D. U. Denison to No. 12 (B) Sqdn., Andover, 29.8.33. J. L. H. Fletcher to No. 32 (F) Sqdn., 18.8.33. S. F. Godden to No. 19 (F) Sqdn., Duxford, 26.8.33. C. Griffiths to No. 12 (B) Sqdn., Andover, 29.8.33. A. J. D. Harding to No. 18 (B) Sqdn., Upper Heyford, 21.8.33. J. H. Hill to No. 19 (F) Sqdn., Duxford, 21.8.33. N. Hope to No. 207 (B) Sqdn., Bircham Newton, 21.8.33. E. M. Lewis to No. 33 (B) Sqdn., Bicester, 29.8.33. G. E. Macdonald to No. 41 (F) Sqdn., Northolt, 21.8.33. D. P. McKeown to No. 23 (F) Sqdn., Biggin Hill, 21.8.33. J. H. R. Oldfield to No. 35 (B) Sqdn., Bircham Newton, 26.8.33. A. S. Q. Robins to No. 57 (B) Sqdn., Upper Heyford, 21.8.33. J. F. Hobler to No. 100 (B) Sqdn., Donibristle, 4.9.33. A. H. Fear to No. 26 (A.C.) Sqdn., Catterick, 28.8.33. A. J. Kennedy to No. 26 (A.C.) Sqdn., Catterick, 28.8.33.

**Acting Pilot Officers :** F. W. Hilton to No. 216 (B.T.) Sqdn., 19.8.33. D. R. Keiller to No. 47 (B) Sqdn., Khartoum, 23.8.33.

The undermentioned Acting Pilot Officers are posted to Royal Air Force Depot, Uxbridge on 1.9.33. On appointment to Short Service Comms. :—H. V. Alloway, S. S. Bertram, A. P. W. Cane, K. Capel-Cure, E. L. Colbeck-Welch, L. P. Gibson, H. A. R. Holford, G. E. Jackson, V. H. A. McBratney, A. M. Mulliken, C. P. L. Nicholson, J. J. Page, C. R. Pavlor, B. V. Robinson, E. U. G. Solbé, G. J. D. Thomson, R. H. Waterhouse and S. G. White.

### Stores Branch

**Flight Lieutenants :** F. B. Ludlow, O.B.E., M.C., to No. 1 Stores Depot, Kidbrooke, 1.9.33. O. G. Ridley, M.C., to R.A.F. Training Base, Leuchars, 1.9.33.

### Medical Branch

**Flight Lieutenant** G. W. McAleer to Medical Training Depot, Halton, 4.9.33.

### Accountant Branch

**Flight Lieutenant** V. G. A. Bennett to Station H.Q., Biggin Hill, 1.9.33.

## NAVAL APPOINTMENTS

The following appointments have been made by the Admiralty :—

### ROYAL NAVAL VOLUNTEER RESERVE

**Lieutenants :** W. R. McLean to *Viceroy*; E. N. Jacquin, to *Vortigern*; and R. F. Carse, to *Courageous* (September 16).

## A Fast Trip to Scotland

THE AIRCRAFT EXCHANGE AND MART, the selling agents for the Airspeed "Courier," demonstrated very conclusively the high cruising speed which this machine possesses when they flew to Scotland and back recently. They left Portsmouth at 9.34 a.m. on Monday, September 18, and arrived at Renfrew at 12.27 p.m., which makes their average speed about 131 m.p.h. This flight was not accomplished through ideal weather, as it was raining for a large portion of the route, with low clouds in many places, which necessitated climbing high to get above them. In Glasgow the "Courier" (Armstrong-Siddeley "Lynx") was demonstrated to Mr. J. Sword, of Midland & Scottish Air Ferries, Ltd., and to officials of the Scottish Motor Traction Co., Ltd.; a letter from the Lord Mayor of Portsmouth was also delivered to the Lord Provost of Glasgow. In the afternoon, at 4.28 p.m.,

a start was made on the return flight to Hanworth, which was reached at 6.58 p.m., giving an average speed of 138 m.p.h. This machine was illustrated in *FLIGHT* recently, and has since that time been fitted with homing wireless and a full equipment of blind flying instruments. The flight was mainly to show that fast trips of this nature, fast enough to compete with the train service, are a possibility, and according to information the company has received from the meteorological office it should be feasible on about 330 days in the year. Under these conditions it may be possible to start a regular air line which would pay. It is however asking a great deal of the pilot, and probably very good ground service and dissemination of weather reports would be necessary to achieve success. The "Courier" with its high cruising speed is certainly an admirable machine for the job, particularly as the pilot has an excellent outlook.

## BRIEFLY

"A STATE OF EMERGENCY" existed in Calcutta recently owing to the advance on the city of mosquitoes. Two years ago aeroplanes were used to combat a similar invasion.

AEROPLANES assisted Federal and City Police of Chicago to fight kidnappers, who were reported to be responsible for the disappearance of Jacob Factor, the financier.

MR. F. H. JOLLY, who has been Secretary of the Eastern Counties Aeroplane Club since its beginning in January, 1931, and who was also during that time a Director and Chairman of the Board, has now left the Club, due to its reconstruction. With his past experience of this Club, he should be valuable, and anyone who wants a club secretary should apply to him at 25, Landseer Road, Ipswich.

THE first exhibition of the Air Force Artists' Association will be held from October 2 to October 14 in the Whale Hall of the Natural History Museum, South Kensington.

MR. T. ROSE has just been appointed Manager and Chief Instructor of the Northamptonshire Aero Club.

THE Shackleton-Murray pusher, the S.M.1, has left Hanworth for Martlesham Heath to undergo its test for a C. of A.

AN International Gliding school, under the direction of Robert Kronfeld, the famous Austrian glider, is to be opened shortly at Salzburg. The school will have its own workshops for the provision of up-to-date machines. It will be established near the Gaisberg in Salzburg, which is considered by experts to be the best gliding ground in the world.

## Vickers, Ltd., and Its Activities

THERE would appear to be a certain amount of misunderstanding in some foreign countries with regards to Vickers, Ltd. In order to clarify the position, we append a brief statement of the position. Vickers, Ltd., is a holding company, with its interests confined to the following groups:—

- (1) Armament, shipbuilding, steel and engineering, through Vickers-Armstrongs, Ltd.
- (2) Rolling-stock, through Metropolitan-Cammell Carriage, Wagon & Finance Co., Ltd.
- (3) Aviation, through Vickers (Aviation), Ltd.
- (4) Sundry British industrial undertakings wholly controlled by Vickers, Ltd.

Vickers-Armstrongs, Ltd., has resulted from a fusion of the shipping and armament interests of Vickers and Sir W. G. Armstrong, Whitworth & Co., Ltd., and the English Steel Corporation, which itself was a combination of the steel interests of Vickers-Armstrong and Cammell Laird & Co.

Vickers-Armstrong are not associated with any other companies in the Armstrong-Whitworth group, but they have a small subsidiary company in Spain and minority holdings in companies in Spain, Japan and Roumania.

The Metropolitan Cammell Carriage, Wagon & Finance Co. resulted from a fusion of the rolling-stock interests of Vickers and Cammell Laird. Vickers (Aviation), Ltd., consists of Vickers (Aviation), Ltd., at Weybridge, and the Supermarine Aviation Works (Vickers), Ltd., at Southampton. This company has no foreign associated concerns.

In 1926 Vickers sold the whole of its interests in Canadian Vickers, Ltd., and that company still carries on business in Canada under its original name. Similarly, Vickers disposed of the whole of its control in Metropolitan-Vickers, Ltd., and they now only hold a minority interest, with participation in control or management. They also have a minority holding in the Vickers-Commonwealth Steel Co. in Australia, but do not control that undertaking. Vickers (Ireland), Ltd., is, however, a subsidiary of Vickers-Armstrongs, Ltd.

It will be seen, therefore, from this information, which we have received from Vickers, Ltd., that there is no truth in the assertions, which have appeared from time to time in foreign newspapers, that Vickers were interested in armament firms throughout the world like those of Skoda, Schneider and Bofors.

## Townend Rings

IN a little booklet, produced by Boulton & Paul, 139, Queen Victoria Street, E.C.4, the difference that the Townend Ring makes to a machine is illustrated. It is claimed, and nowadays generally accepted, that a Townend Ring can reduce the resistance of air-cooled radial engines by about two-thirds. The ring is also used as a collector for exhaust in place of the rather cumbersome exhaust ring of earlier radial engines. The Westland "Wapiti's" speed was raised more than 10 m.p.h. by fitting a Townend Ring to its "Jupiter." An Armstrong-Whitworth "Atlas," with a "Panther," was speeded up by about 20 m.p.h.; an Airspeed "Courier," with Armstrong-Siddeley "Lynx" about 15 m.p.h.; a Boulton & Paul "Sidestrand," 2 "Jupiter" VIII F, about 12½ m.p.h., and a Morane fighter, about 14 m.p.h.

## Patents

The procedure of obtaining patents is a bit of a mystery to most people and supposed to be a long and complicated business. Mr. B. T. King, C.I.M.E., of King's Patent Agency, Wardrobe Chambers, 146A, Queen Victoria Street, E.C.4, has produced an interesting little booklet which explains the matter in a few pages. The booklet explains that before taking out a patent, enquiry should be made, by study of patent records, whether a patent for the particular invention has not been taken out before. For instance it is popularly supposed that Dunlop was the inventor of pneumatic tyres, whereas in reality a patent for a pneumatic tyre was taken out in 1845, 43 years previous to Dunlop.

## PUBLICATIONS RECEIVED

- Compression-Ignition Engines for Road Vehicles.* By the Editor of *The Commercial Motor*. London: Temple Press, Ltd. Price 2s. 6d. net.
- Earl Haig's British Legion Appeal Fund.* Poppy Day Report, 1932.
- Annual Report of the Director of the Meteorological Office presented by the Meteorological Committee to the Air Council.* Year ended March 31, 1933. Price 1s. net. London: H.M. Stationery Office, W.C.2.
- Aeronautical Research Committee Reports and Memoranda: No. 1538. Effect of Ribs on Stresses in Spars.* By D. Williams and H. Roxbee Cox. January, 1933. Price 1s. net. London: H.M. Stationery Office, W.C.2.
- Aeronautical Research Committee Reports and Memoranda: No. 1542. Silencing Aircraft.* By A. H. Davis. September, 1932. Price 9d. net. London: H.M. Stationery Office, W.C.2.
- Aeronautical Research Committee Reports and Memoranda: No. 1486. Oil Cooling for Aircraft.* By B. C. Carter. September, 1931. Price 3s. 6d. net. London: H.M. Stationery Office, W.C.2.
- Aeronautical Research Committee Reports and Memoranda: No. 1528. Determination of the Stresses in Braced Frameworks.* By L. Chitty. October, 1932. Price 1s. 9d. net. London: H.M. Stationery Office, W.C.2.
- Wheels take Wings.* By M. Burn and A. P. Bradley. G. T. Foulis & Co., Ltd. Price 7s. 6d. net.

## NEW COMPANIES REGISTERED

H. HEMMING AND PARTNERS, LTD.—Capital, £10,000, in £1 shares. Objects, to acquire and utilise the experience of H. Hemming in connection with air survey and air transport work with a view to developing such work within the British Empire or elsewhere, to co-ordinate the various interests which may be served by carrying out such work, to adopt an agreement between Western Mining Corporation, Ltd., of the one part and H. Hemming and J. Horsfall of the other part. Permanent directors:—Harold Hemming, 87, Belsize Lane, N.W.3, aeronautical expert (governing director); James Horsfall, 43, Fitzjames Avenue, W.14, engineer.

NORMAN EDGAR (WESTERN AIRWAYS), LTD., 9, Denmark Street, Bristol.—Capital, £7,500, in £1 shares. Acquiring the business of aircraft dealers and air transport contractors now carried on by Norman Edgar and Co. at Whitechurch, nr. Bristol, to establish, maintain, work and carry on lines of aerial connection by means of aeroplanes, seaplanes, and other aerial conveyances, etc. Directors:—Norman W. G. Edgar, "Braeside," Little Stoke, Stoke Bishop, Bristol; Leslie I. Arnott, Claremont, Monmouth (director of Tintern Quarries, Ltd.); David B. Gray, 11, Combe Park, Bath.

## AERONAUTICAL PATENT SPECIFICATIONS

*Abbreviations:* Cyl. = cylinder; i.c. = internal combustion; m. = motors (The numbers in brackets are those under which the Specification will be printed and abridged, etc.)

### APPLIED FOR IN 1932

*Published September 21, 1933*

- 1,734. BENDIX AVIATION CORPORATION. Screw propellers. (397,486.)
- 4,865. BENDIX AVIATION CORPORATION. Engine-starting mechanism. (397,535.)
- 5,420. INDIA RUBBER, GUTTA PERCHA AND TELEGRAPH WORKS CO., LTD., and F. J. TARRIS. Aircraft-wheel brakes. (397,497.)

### APPLIED FOR IN 1933

*Published September 21, 1933*

- 11,621. ASKANIA-WERKE AKT.-GES. VORM. CENTRAL WERKSTATT DESSAU UND C. BAMBERG-FRIEDENAU. Automatic steering-apparatus for aircraft. (397,805.)

# BRITISH AIRCRAFT TRADE DIRECTORY.

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## AERODROME EQUIPMENT

W. Bain & Co., Ltd.,  
Lochrin Iron Works, Coatbridge. Coatbridge 470.  
F. Bevis, Ltd.,  
Wolfe Road, Portsmouth. Portsmouth 3286.  
Boulton & Paul, Ltd.,  
Norwich. Norwich 851.  
Cellacite & British Uralite, Ltd.,  
Higham, Kent. Hol. 3691.  
Chance Bros. & Co., Ltd.,  
Smethwick, Birmingham. W. Bromwich 1306.  
Educational Supply Association, Ltd.,  
171, High Holborn, London, W.C.1. Hol. 9116.  
The En-Tout-Cas Co., Ltd.,  
Syston, nr. Leicester. Syston 86177.  
A. L. Gibson & Co., Ltd.,  
Radnor Works, Strawberry Vale, Middx.  
Harvey Frost & Co., Ltd.,  
148-150, Great Portland St., London. W.1. Mus. 3841.  
Horseley Bridge Engineering Co., Ltd.,  
Birmingham. Bir. Cen. 6989.  
James Hunter, Ltd.,  
Chester. Chester 754.  
A. & A. J. Law, Ltd.,  
132, Kingston Road, S.W.19. Lib. 3300.  
The London Electric Firm,  
South Croydon, Surrey. Purley 1222.  
Ransome, Sims & Jefferies, Ltd.,  
Orwell Works, Ipswich. Ipswich 2201.  
Ripon Steel Co., Ltd.,  
Ripon. Ripon 202.  
Sperry Gyroscope Co., Ltd.,  
Great West Road, Erentford. Eal. 6771.  
Zwicky, Ltd.,  
Slough, Bucks. Slough 332.

## AERO ENGINE MANUFACTURERS

A.B.C. Motors, Ltd.,  
Walton-on-Thames, Surrey. W.-on-T. 774-5.  
A.D.C. Engines, Ltd.,  
Waddon Factory, Croydon, Surrey. Fairfield 4393.  
Armstrong Siddeley Motors, Ltd.,  
Coventry. Cov. 4061.  
The Bristol Aeroplane Co., Ltd.,  
Filton House, Bristol. Bristol 45051.  
British Salmson Aero-Engines, Ltd.,  
New Malden, Surrey. Wim. 3901.  
Cirrus-Hermes Engineering Co., Ltd.,  
Purley Way, Waddon, Croydon. Croy. 2410.  
De Havilland Aircraft Co., Ltd.,  
Stag Lane Aerodrome, Edgware, Middlesex. Edgware 0171.  
D. Napier & Son, Ltd.,  
Acton, London, W.3. Shep. Bush 1220.  
Pobjoy Airmotors, Ltd.,  
Hooton Park Aerodrome, Cheshire. Hooton 221.  
Rolls-Royce, Ltd.,  
14-15, Conduit Street, London, W.1. May. 6201.  
Wolsley Motors (1927), Ltd.,  
Drews End, Ward End, Birmingham. Bir. East 1501.

## AIRCRAFT AGENTS

W. W. Adam,  
653, Grand Buildings, W.C.2. Whi. 1343.  
Aircraft Exchange & Mart,  
7, Park Lane, W.1. Gro. 3071.  
Air Taxis, Ltd.,  
Stag Lane Aerodrome, Edgware, Middlesex. Edg. 0234.  
Auto-Auctions, Ltd.,  
Horseferry Rd., Westminster, S.W.1. Vic. 8761.  
Brooklands Aviation, Ltd.,  
Byfleet, Surrey. Byfleet 436.  
Henlys (1928), Ltd.,  
Heston Air Port, Middlesex. Hayes 410.  
Brian Lewis and Co. Ltd.,  
Heston Air Port, Middlesex. Hayes 410.  
Norman Edgar (Western Airways),  
Bristol Airport. Bristol 41165.  
Phillips & Powis Aircraft (Reading), Ltd.,  
Woodley Aerodrome, Reading. Sonning 114.

## CLOTHING

Alkit, Ltd.,  
Cambridge Circus, London, W.C.2. Tem. 1814.  
Austin Reed, Ltd.,  
Regent Street, London, W.1. Reg. 7911.  
Burberry, Ltd.,  
18, Haymarket, S.W.1. Reg. 5483.  
Burch's,  
33, Bedford Street, Ldn., W.C.2. Tem. 7861.  
Gieves, Ltd.,  
21, Old Bond Street, London, W.1. Reg. 6411.  
D. Lewis, 124, Great Portland Street,  
London, W.1. Mus. 4314.  
S. Lewis,  
19-27, Carburton Street, London, W.1. Mus. 4793.  
E. B. Meyrowitz, Ltd.,  
1A, Old Bond Street, London, W.1. Ger. 8876.  
Moss Bros. & Co., Ltd.,  
20, King Street, W.C.2. Tem. 3341.  
Robinson & Cleaver, Ltd.,  
156, Regent Street, London, W.1. Ger. 1070.  
Selfridge & Co., Ltd.,  
Oxford Street, London, W.1. May. 1234.  
Wainwright,  
300-2, Euston Road, London, N.W.1. Mus. 6280

## DOPE, PAINT AND VARNISH

British Celanese, Ltd., Celanese House,  
Hanover Square, London, W.1. May. 8000.  
Cellon, Ltd.,  
Upper Ham Road, Kingston-on-Thames. Kingston 6061.  
J. Hall & Sons, Ltd.,  
Bristol. Bristol 22101.  
Llewellyn Ryland, Ltd.,  
Balsall Heath Works, Birmingham. Calthorpe 2284.  
Nobel Chemical Finishes, Ltd.,  
Slough, Bucks. Slough 28.  
Pinchin Johnson & Co., Ltd.,  
4, Carlton Gardens, S.W.1.  
Titanine-Emaillite, Ltd.,  
166, Piccadilly, London, W.1. Reg. 7413.

## AIRCRAFT COMPONENTS

Aircraft Components, Ltd.,  
Grosvenor Place, South Cheltenham, Glos. Cheltenham 3755.  
The Airscrew Co., Ltd.,  
Weybridge, Surrey. Weybridge 705.  
Arens Control, Ltd.,  
2, South Wharf, Praed Street, W.2. Pad. 9958.  
Auster, Ltd.,  
Crown Works, Barford Street, Birmingham. Midland 2123.  
Bakelite, Ltd.,  
68, Victoria Street, London, S.W.1. Vic. 5441.  
Best & Lloyd, Ltd.,  
Handsworth, Birmingham. Smethwick 0035.  
Alfred Beebee,  
Fallings Heath, Wednesbury.  
Bifurcated & Tubular Rivet Co., Ltd.,  
Aylesbury.  
Boulton & Paul, Ltd.,  
Norwich. Norwich 851.  
Brown Bros., Ltd.,  
Great Eastern Street, London. Bis. 7654.  
E. G. Brown & Co., Ltd.,  
West Road, Northumberland Park, N. 17. Tot. 2257-8.  
Bruntons, Ltd.,  
Wire Mills, Musselburgh, Scotland. Musselb. 28.  
Burley, Ltd.,  
192, Tottenham Court Road, London, W.1. Mus. 5042.  
W. P. Butterfield, Ltd.,  
Tank Works, Shipley, Yorks.  
Fairey Aviation Co., Ltd.,  
Hayes, Middlesex. Hayes 400.  
J. W. Gates & Co., Ltd.,  
133, Oxford Street, London, W.1. Reg. 1164.  
Guest, Keen & Nettlefolds, Ltd.,  
Birmingham.  
Metal Propellers, Ltd.,  
Purley Way, Croydon. Thornton H. 1290.  
Frederick Mountford (Birmingham), Ltd.,  
Moseley Street, Birmingham. Midland 3488.  
Mollart Engineering Co.,  
Thames Ditton, Surrey. Emberbrook 1846.  
North British Components, Ltd.,  
Merefield, Rochdale.  
R.F.D. Co.,  
17, Stoke Road, Guildford. Guildford 1289.  
Rubery Owen & Co., Ltd.,  
Darlaston, Staffs. Darlaston 130.  
L. A. Rumbold & Co., Ltd.,  
Kingsgate Place, N.W.6. Mai. 3772.  
Simmonds Accessories, Ltd.,  
55, Turnmill Street, E.C.1. Clerk. 7489.  
Triplex Safety Glass Co., Ltd.,  
1, Albemarle Street, London, W.1. Reg. 1321.  
Vaughan Bros., Ltd.,  
Willenhall, Staffordshire.  
Vickers Aviation, Ltd.,  
Broadway, Westminster, S.W.1. Vic. 6900.

## AIRCRAFT MANUFACTURERS

Airspeed, Ltd.,  
The Airport, Portsmouth.  
Sir W. G. Armstrong Whitworth Aircraft, Ltd.  
Whitley, Coventry. Cov. 2333.  
Arrow Aircraft (Leeds), Ltd.,  
Little Russell Street, Whitehall Road, Leeds.  
The Blackburn Aeroplane & Motor Co., Ltd.,  
Brough, Yorkshire. Brough 121.  
Boulton & Paul, Ltd.,  
Norwich. Norwich 851.  
The Bristol Aeroplane Co., Ltd.,  
Filton House, Bristol. Bristol 45051.  
British Klemm Aeroplane Co., Ltd., Hanworth  
Aerodrome, Middlesex. Feltham 378.  
The Cierva Autogiro Co., Ltd.,  
Bush House, Aldwych, London, W.C.2. Tem. 2561.  
The Comper Aircraft Co., Ltd.,  
Heston Airport, Middlesex. Hayes 410.  
The De Havilland Aircraft Co., Ltd.,  
Stag Lane Aerodrome, Edgware. Edg. 0171.  
The Fairey Aviation Co., Ltd.,  
Hayes, Middlesex. Hayes 400.  
General Aircraft, Ltd.,  
Air Port of London, Croydon, Surrey. Fair-  
field 4161.  
The Gloster Aircraft Co., Ltd.,  
Hucclecote, Gloucester. Barnwood 94.  
Handley Page, Ltd.,  
Cricklewood, London, N.W.2. Gla. 5454.

Hawker Aircraft, Ltd.,  
Canbury Park Road, Kingston-on-Thames. Kingston 6272.  
George Parnall & Co., Ltd.,  
Yate Aerodrome, Gloucestershire. Chipping Sodbury 50.  
Percival Aircraft Co.,  
20, Grosvenor Place, S.W.1. Sloane 3274.  
Redwing Aircraft Co., Ltd.,  
Gatwick Aerodrome, Lowfield Heath, Surrey. Crawley 321.  
A. V. Roe & Co., Ltd.,  
Newton Heath, Manchester. Colehurst 2731.  
Saunders-Roe, Ltd.,  
East Cowes, Isle of Wight. Cowes 193.  
Short Bros. (Rochester & Bedford), Ltd.  
Rochester, Kent. Chatham 2261.  
Spartan Aircraft, Ltd.,  
East Cowes, Isle of Wight. Cowes 193.  
The Supermarine Aviation Works, Ltd.,  
Woolston, Southampton. Woolston 88201.  
Vickers Aviation, Ltd.,  
Byfleet Road, Weybridge, Surrey. Byfleet 240.  
Westland Aircraft Works, Ltd.,  
Yeovil, Somerset. Yeovil 141.

## FLYING SCHOOLS

Agra Engineering Co. & Flying School, Ltd.,  
Haldon Aerodrome, Teignmouth, S. Devon. Teignmouth 125.  
Air Service Training, Ltd.  
Hamble, Southampton. Hamble 357.  
Airwork, Ltd.,  
Heston Aerodrome, Middlesex. Hayes 410.  
British Air Transport,  
Air Port of London, Croydon. Surrey. Fel. 4111.  
Brooklands School of Flying, Ltd.,  
Brooklands Aerodrome, Byfleet, Surrey. Byf. 436.  
De Havilland School of Flying, Ltd.,  
Hatfield. Hatfield 250.  
Lancashire School of Aviation, Ltd.,  
Squire's Gate, Blackpool. Black. 2 '29.  
Marshall's Flying School, Ltd.,  
Cambridge. Cam. 1631.  
National Flying Services, Ltd.,  
London Air Park, Hanworth. Feltham 236.  
North Sea Aerial & General Transport, Ltd.,  
Brough, East York. Brough 93.  
Northern Air Lines, Ltd.,  
Air Port of Manchester, Lancs. Eccles 1873.  
Phillips & Powis Aircraft, Ltd.,  
Woodley Aerodrome, Reading. Sonning 114.  
Rollason Aviation, Ltd.,  
Ford Aerodrome, Yapton, Sussex. Yapton 222.  
Surrey Flying Services, Ltd.,  
Air Port of London, Croydon, Surrey. Croydon 1736.  
Universal Aircraft Services, Ltd., Witney  
Aerodrome, Oxon. Witney 170.

## FUEL, OIL AND GREASE

Anglo-American Oil Co., Ltd.,  
36, Queen Anne's Gate, Westminster, S.W.1. Vic. 6325.  
W. B. Dick & Sons, Ltd.,  
26, Grosvenor Gdns., Ldn., S.W.1. Slo. 3461.  
Dominion Motor Spirit Co., Ltd.,  
34, Bishopsgate, E.C.2. Ave. 6747.  
A. Duckham & Co., Ltd.,  
Duckham House, 16, Cannon Street, E.C.4. Cent. 6246.  
Germ Lubricants, Ltd.,  
736, Salisbury House, E.C.2. Met. 4283.  
National Benzole Co., Ltd.,  
Buckingham Gate, London, S.W.1. Vic. 7812.  
The Redline Motor Spirit Co., Ltd.,  
16, Charles Street, London, S.W. Whi. 2134.  
Shell-Mex & B.P. Ltd.,  
Shell-Mex, Strand, W. Tem. 1234.  
Sternol, Ltd.,  
Royal London House, Finsbury Square, E.C.2. Nat. 7644.  
Silvertown Lubricants, Ltd.,  
Minoco Wharf, Ldn., E.16. Albert Dock 1074.  
Tecalmit, Ltd.,  
Great West Road, Brentford. Eal. 6661.  
Vacuum Oil Co., Ltd.,  
Caxton House, Westminster, London, S.W.1. Vic. 6620.  
C. C. Wakefield & Co., Ltd.,  
Wakefield House, Cheapside, London, E.C.2. Cen. 3089.

## GENERAL ACCESSORIES

Best & Lloyd, Ltd.,  
Handsworth, Birmingham. Smethwick 0035.  
Birmingham Medal Co., Ltd.,  
22, Frederick Street, Birmingham.  
D. H. Bonnell & Son, Ltd.,  
46-48, Osnaburgh Street, London, N.W.1. Mus. 1882.  
British Thomson-Houston Co., Ltd.,  
Alma Street, Coventry.  
Britannia Batteries, Ltd.,  
233, Shaftesbury Avenue, W.C.2. Tem. 7971.  
The Chloride Electrical Storage Co., Ltd.,  
Clifton Junction, nr. Manchester.  
Desoutter Bros., Ltd.  
The Hyde, Hendon, London, N.W.9. Colin. 6346  
Ilford, Ltd.,  
Ilford, London. Ilford 3000.



## GENERAL ACCESSORIES (Contd.)

Mechanism.  
6A, George Street, Croydon, Surrey. Fai 4240.  
J. Lucas, Ltd.,  
Great King Street, Birmingham. Northern 5201.  
D. Moseley & Sons,  
Ardwick, Manchester. Ard. 3341.  
The Pyrene Co., Ltd.,  
Great West Road, Chiswick.  
Siebe, Gorman & Co., Ltd.,  
187, Westminster Bridge Road, S.E.1. Hop. 3401  
E. Stanford Ltd.,  
12, Long Acre, London, W.C.2. Tem. 1321.  
Vickers, Ltd.,  
Broadway, Westminster, S.W.1. Vic. 6900.  
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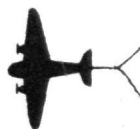
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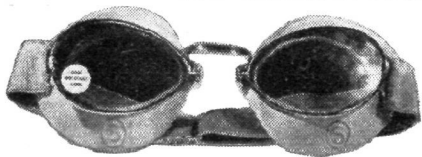
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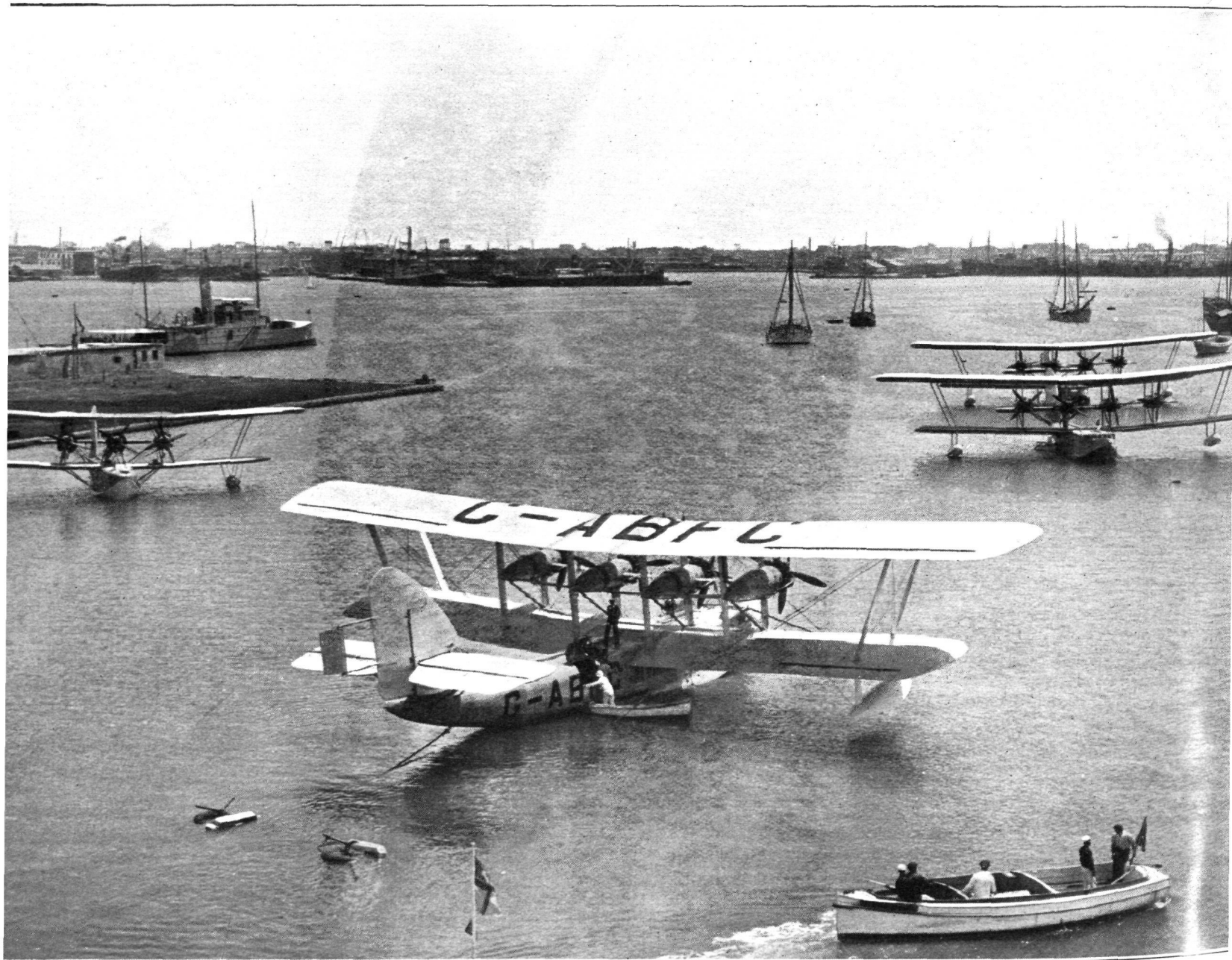
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